WIN XP FIX-IT GUIDE

How to use all the built-in diagnostics!

BEST CASE MODS OF 2002

8 winners of the world's most prestigious mod contest

MAXIMUM PC

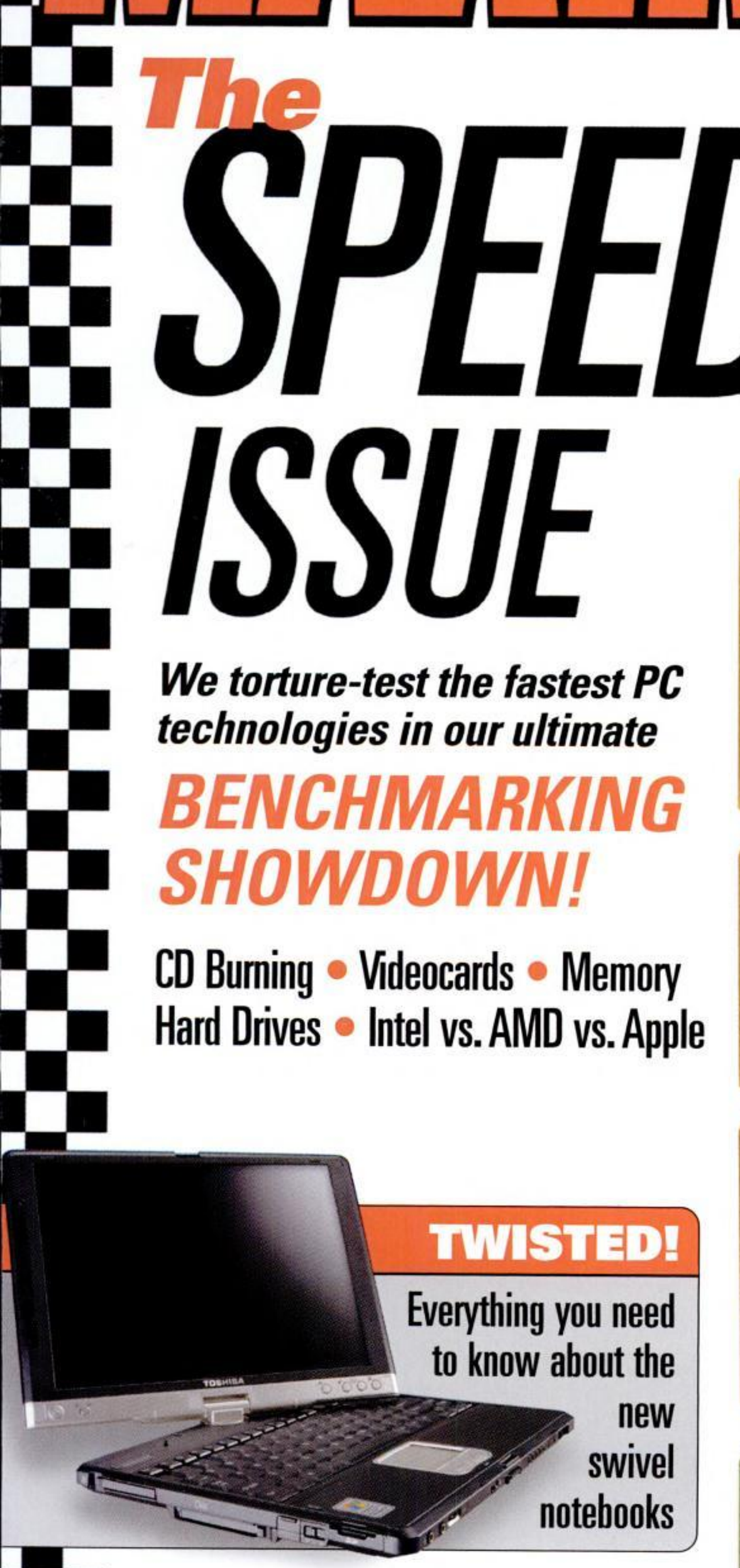
MINIMUM BS

The SPEED ISSUE

We torture-test the fastest PC technologies in our ultimate

BENCHMARKING SHOWDOWN!

CD Burning • Videocards • Memory
Hard Drives • Intel vs. AMD vs. Apple



TWISTED!

Everything you need to know about the new swivel notebooks

MARCH 2003

future network usa
Media with Passion
$7.99US $9.99CAN
03
0 74470 03353 0

Copyrighted material

Great power. Blazing speed.
You'll have 3D villains surrendering in no time.

Select Dell desktops feature high performance Intel® Pentium® 4 Processors.

Click or call for our latest pricing and promotions.

Excellent for conquering strange new worlds or just escaping from this one. Dell offers a wide variety of desktops and notebooks that come fully equipped with the power, speed and high performance to take your PC experience to new levels. When you order from Dell, you'll get exactly what you want and need to make a PC that's uniquely yours. Since Dell uses high-quality, reliable technology, like Intel® Pentium® 4 Processors with awesome performance for gaming, music, digital photos, and beyond, you know you're getting a high-quality, reliable PC. And, as always, it comes backed by award-winning service and support available 24/7, 365 days a year. Best of all, when you order direct, you get the right PC at the right price. So go online or call today. We'll show you how easy it is to score a great PC.

Dell | Home Notebooks

Inspiron™ 2650 Notebook

Mobile Gaming Starter
- Mobile Intel® Pentium® 4 Processor-M at 1.80GHz
- 15" XGA TFT Display
- 384MB DDR PC2100 SDRAM
- 30GB* Ultra ATA Hard Drive
- 24x CD-RW/DVD Combo Drive with Roxio's Easy CD Creator®
- 16MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4x Graphics
- Sound Blaster® Compatible
- 59WHr Li-Ion Battery (8 cell)
- Internal Modem and NIC Included
- Microsoft® Windows® XP Home Edition
- WordPerfect® Productivity Pack with Quicken® New User Edition

$1479 or as low as **$45**/mo.*
E-VALUE Code: 16459-D80214m

Make this your perfect PC:
- 512MB DDR PC2100 SDRAM, add $100
- 40GB* Performance Hard Drive, add $90
- 32MB DDR NVIDIA® GeForce2 Go™200 AGP 4x Graphics, add $99
- Custom Leather Case, add $99

Inspiron™ 4150 Notebook

Thin and Light Gamer's Dream
- Mobile Intel® Pentium® 4 Processor-M at 1.90GHz
- 14.1" XGA TFT Display
- 512MB DDR PC2100 SDRAM
- 40GB* Performance Hard Drive
- 24x CD-RW/DVD Combo Drive with Roxio's Easy CD Creator®
- 32MB DDR ATI® MOBILITY™ RADEON™ 7500 AGP 4x Graphics
- Sound Blaster® Compatible Sound with Wavetable
- 66WHr Li-Ion Battery with ExpressCharge™ Technology (8 cell)
- Internal Modem and NIC Included
- Dolby® Headphone Solution
- Microsoft® Windows® XP Home Edition, Microsoft® Works Suite

$1899 or as low as **$57**/mo.*
E-VALUE Code: 16459-D80218n

Make this your perfect PC:
- Mobile Intel® Pentium® 4 Processor-M at 2GHz, add $50
- Windows® XP Professional, add $79
- Burlwood Colored Display Back and Palm Rest Inserts, add $29
- Notebook Backpack, add $79

Inspiron™ 8200 Notebook

Ultimate Mobile Gaming Machine
- Mobile Intel® Pentium® 4 Processor-M at 2.40GHz
- 15" UltraSharp™ UXGA TFT Display
- 512MB DDR PC2100 SDRAM
- 60GB* Performance Hard Drive
- 24x CD-RW/DVD Combo Drive with Roxio's Easy CD Creator®
- ATI® MOBILITY™ RADEON™ 9000 64MB DDR 4x AGP Graphics
- Sound Blaster® Compatible Sound with Wavetable
- 66WHr Li-Ion Battery with ExpressCharge™ Technology (8 cell)
- Internal Modem and NIC Included
- Microsoft® Windows® XP Professional, Microsoft® Works Suite

$2779 or as low as **$84**/mo.*
E-VALUE Code: 16459-D80227m

- Microsoft® Office XP Small Business, add $114
- 64MB USB Memory Key, add $59
- External Harman Kardon HK-395 Speakers with Subwoofer, add $59
- Kenneth Cole Leather Case by Dell, add $249

Copyrighted material

Dell | Home Desktops

Dimension™ 4550 Desktop

Superior Performance, Smart Value

- Intel® Pentium® 4 Processor at 2.66GHz with 533MHz Front Side Bus and 512K L2 Cache
- 512MB DDR SDRAM at 266MHz
- NEW 60GB* Ultra ATA/100 Hard Drive (7200 RPM)
- 19" (18.0" v.i.s., .24dp) M992 Monitor
- NEW 128MB DDR ATI® RADEON™ 9700 TX Graphics Card with TV-Out and DVI
- 16x DVD-ROM Drive
- Sound Blaster Live! 5.1 Digital Sound Card
- Altec Lansing® ADA745 4.1 Surround Sound Speakers with Subwoofer
- 56K* PCI Telephony Modem
- Integrated Intel® PRO 10/100 Ethernet
- Microsoft® Windows® XP Home Edition
- WordPerfect® Productivity Pack with Quicken® New User Edition

$1549 or as low as **$47**/mo.*
E-VALUE Code: 16459-D50215m

Make this your perfect PC:

- NEW 128MB DDR ATI® RADEON™ 9700 Pro Graphics Card with TV-Out and DVI, add $180
- 21" (19.9" v.i.s., .24AG) P1130 FD Trinitron® Monitor, add $390
- 1GB DDR SDRAM at 266MHz, add $200
- NEW 120GB* Ultra ATA/100 Hard Drive (7200 RPM), add $110

Dimension™ 8250 Desktop

Cutting Edge Technology

- Intel® Pentium® 4 Processor at 2.66GHz with 533MHz Front Side Bus and 512K L2 Cache
- 512MB PC1066 RDRAM
- NEW 60GB* Ultra ATA/100 Hard Drive (7200 RPM)
- 19" (18.0" v.i.s., .24dp) M992 Monitor
- NEW 128MB DDR ATI® RADEON™ 9700 TX Graphics Card with TV-Out and DVI
- 16x DVD-ROM Drive
- 40x/10x/40x CD-RW Drive with Roxio's Easy CD Creator® (2nd bay)
- Sound Blaster Live! 5.1 Digital Sound Card
- Altec Lansing® ADA745 4.1 Surround Sound Speakers with Subwoofer
- 56K* PCI Telephony Modem
- Integrated Intel® PRO 10/100 Ethernet
- Microsoft® Windows® XP Home Edition
- WordPerfect® Productivity Pack with Quicken® New User Edition

$1999 or as low as **$60**/mo.*
E-VALUE Code: 16459-D50219m

Make this your perfect PC:

- 1GB PC1066 RDRAM, add $420
- NEW 120GB* Ultra ATA/100 Hard Drive (7200 RPM), add $110
- NEW 128MB DDR ATI® RADEON™ 9700 Pro Graphics Card with TV-Out and DVI, add $180

Dimension™ 8250 Desktop

Extreme Gaming Machine

- Intel® Pentium® 4 Processor at 3.06GHz with HT Technology
- 512MB PC1066 RDRAM
- NEW 200GB* Ultra ATA/100 Hard Drive (7200 RPM) with DataBurst™ Cache
- 19" (18.0" v.i.s., .24dp) M992 Monitor
- NEW 128MB DDR ATI® RADEON™ 9700 Pro Graphics Card with TV-Out and DVI
- 16x DVD-ROM Drive
- NEW 48x/24x/48x CD-RW Drive with Roxio's Easy CD Creator® (2nd bay)
- Sound Blaster Live! 5.1 Digital Sound Card
- Altec Lansing® ADA745 4.1 Surround Sound Speakers with Subwoofer
- 56K* PCI Telephony Modem
- Integrated Intel® PRO 10/100 Ethernet
- Microsoft® Windows® XP Home Edition
- WordPerfect® Productivity Pack with Quicken® New User Edition

$2899 or as low as **$87**/mo.*
E-VALUE Code: 16459-D50228m

Make this your perfect PC:

- NEW 4x DVD+RW/+R* Drive with CD-RW including Roxio's Easy CD Creator® and Sonic™ MyDVD™ (2nd bay), add $140
- 1GB PC1066 RDRAM, add $420
- 21" (19.9" v.i.s., .24AG) P1130 FD Trinitron® Monitor, add $390
- Altec Lansing® THX Certified ADA995 Surround Sound 5.1 Speaker System with Dell™ Enhanced Multimedia Keyboard, add $170

Standard Features

Each DELL system shown has a number of standard features, including:

- Dell Picture Studio Image Expert Standard Edition
- Dell Jukebox Powered by MUSICMATCH®
- 6 Months of MSN® Powered by Dell™ Internet Access Included*
- Dimension Desktops shown here include 1-Year Limited Warranty*; 1-Year At-Home Service Offering*; Keyboard and Mouse
- Inspiron Notebooks shown here include 1-Year Limited Warranty*; 1-Year Mail-In Service Offering

Software & Peripherals

- Canon® MultiPASS F80 Multifunction (Prints, Scans, Copies, and Faxes), $399
- Kodak EasyShare™ LS443 Digital Camera with Dock, $499
- Belkin® Home Office 350 VA UPS Surge, $49
- Detto Intellimover V3.0 Migration Software and Parallel Cable, $50
- Extreme Gaming Bundle, $90
- Roller Coaster Tycoon 2 Game, $30
- Logitech® Wingman Extreme Digital 3D Joystick, $30
- Gravis Gamepad Pro, $15

Service & Support

Upgrade from Standard Warranty and Service Offering to:
3-Year Limited Warranty*; 3-Year At-Home Service Offering*:

- Dimension 4550, 8250, $159
- Inspiron 2650, $179
- Inspiron 4150, 8200, $299

Accidents Happen!
Protect yourself with CompleteCare™ Accidental Damage Protection*:

- Dimension 1-Year, $39
- Dimension 3-Year, $99
- Inspiron 1-Year, $79
- Inspiron 3-Year, $149

intel inside pentium 4

The Perfect PC at the perfect price. Easy as DELL™

Click www.dell4me.com/maxpc Call 1-888-889-4005
toll free

Dell recommends Microsoft® Windows® XP Professional for Mobile Computing

***MSN Powered by Dell: Telephone access (call your phone co. for details) and other surcharges for access may apply. Must register within 30 days of invoice and accept MSN powered by Dell Terms of Service.** You agree to be billed monthly fees after the initial service period. You may cancel service at any time. Offer valid for new customers only in U.S. households and must be over 18 years old with major credit card. Limited time offer.

Pricing/Availability: Prices, specifications, availability and terms of offers may change without notice. Taxes and shipping charges are extra, and vary. Cannot be combined with other offers or discounts. Valid for U.S. Dell Home Systems Co. new purchases only. Dell cannot be responsible for errors in typography or photography. **Limited Warranty:** You can get a copy of our limited warranties and guarantees by writing Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682. To purchase warranty only or for information on other service options please call 1-800-915-3355 or visit dell4me.com/termsand conditions. **Service:** At-Home service provided via third-party contract with customer. Technician will be dispatched, if necessary, following phone-based troubleshooting. Availability varies. Other conditions apply. **Hard Drives:** For hard drives, GB means 1 billion bytes; accessible capacity varies with operating environment. **56K Modem:** Download speeds are limited to 53Kbps. Upload speeds are less (about 30Kbps). Speeds can vary by line condition and modem manufacturer. Analog phone line and service required. **DVD+RW Drives:** Discs burned with this drive may not be compatible with some existing drives and players; using DVD+R Media provides maximum compatibility. **PURCHASE PLAN: Dell Preferred Account:** Offered by CIT Bank to qualified U.S. residents with approved credit. Taxes and shipping charges are extra and vary. **CompleteCare:** CompleteCare service excludes theft, loss, and damage due to fire or intentional damage. CompleteCare is currently not available in all states. Not available for Dell Home Sales customers in CA, FL or NY. Not available for Employee Purchase Program customers (Government, Health Care and Relationship/Faculty, Staff and Students) in CA or FL. May not be available to all customers. For complete details, visit http://www.dell.com/us/en/gen/services/service_service_contracts.htm. **Trademark/Copyright Notices:** Intel, Intel Inside, Pentium and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft, MSN and Windows are registered trademarks of Microsoft Corporation. ©2002-2003 Dell Computer Corporation. All rights reserved.

VALUE™

Keep your E-VALUE CODE handy! It's the easiest way to find and build your perfect PC when you decide to order.

Copyrighted material

Go for the Ultimate Burn!

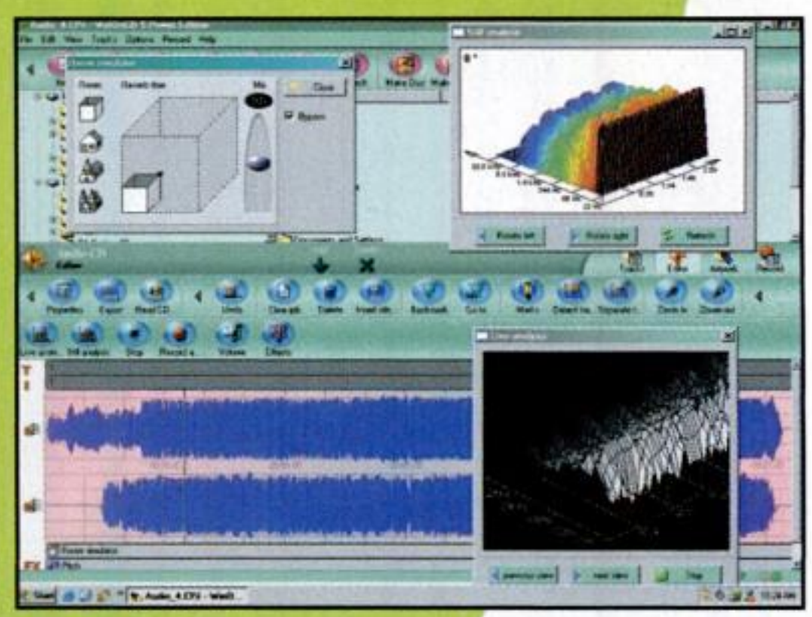
Discover the ultimate German-engineered CD burning software, available for the first time in the U.S. WinOnCD5's high performance data burning and back-up join with powerful audio editing features for a winning combination that has become Germany's #1 selling CD burning software brand.

And there are more options with every mouse click — just explore the possibilities.

INCLUDES:

- ☑ **Data OverSpan™ for backing up your large data files and filesets over multiple discs**
- ☑ **Advanced Sound Editor enables sub-channel editing, index marks, pause between tracks, cross fades and more**
- ☑ **Automatic conversion of WAV, CDA, WMA and MP3 files for burning**
- ☑ **VCD Music Album to organize and play up to 99 albums on one CD**
- ☑ **MP3 encoding and MP3 Music Album with HTML layout and a playlist editor**
- ☑ **Superior noise filters for restoring your analog records**
- ☑ **DVD premastering**

Video CD


Advanced Sound Editor

"When it comes to CD-recording software, CeQuadrat's WinOnCD Version 5.0 Power Edition has clearly taken the lead and set the standard for all others to follow."

Bob Starrett
eMedia Magazine,
December 2002

PC Professionell Editor's Choice — June 2002
20/02 eM Editors' Choice — July 2002
Testsieger Computer easy Ausgabe 5/2002 — May 2002
3/2002 PC Magazin Testsieger — March 2002
PCPraxis — October 2002
CHIP — February 2002

WinOnCD 5 Power Edition is now available at software retailers, including

COMPUSA
WHERE AMERICA BUYS TECHNOLOGY℠

#1 CD-RECORDING SOFTWARE SELLING IN GERMANY

© 2002 Roxio, Inc. All rights reserved. CeQuadrat, WinOnCD and Data OverSpan are trademarks or registered trademarks in the United States and other countries. DirectCD is a trademark of Hughes Electronics, used under license. All other trademarks used are owned by their respective owners.

Copyrighted material

Release Notes

Benchmarking, Buttocks, BackTalk, and Babes

First indication that *Maximum PC* had a punishing production schedule: Phillips chops up his Release Notes into little bulleted items because he doesn't have enough time to organize his wild opinions and conspiracy theories into a single comprehensive essay. But, hey, this is 2003. Everyone likes data in little bits and pieces…

➤ The issue you're now reading might have come together a bit more quickly if Lab benchmarking wasn't such a royal pain in the petard. I give my hardiest kudos to the technical staff for working late nights, building up test beds, and spending more time troubleshooting benchmarking roadblocks than actually accumulating benchmarking data. We all hope you find our Speed Trials story to be informative, and we encourage you to send in ideas for future testing. You have the questions, we have the Lab facilities. Let's work together.

➤ Speaking of petards: Yes, I know that the word means "a metal cone filled with explosives." But the old phrase "hoisted by one's own petard" would seem to suggest something more anatomically oriented, and I didn't want to use the "A" word because we've been getting so many complaints about our potty mouths. For what it's worth, I heard the "A" word no fewer than five times in a *Friends* rerun, and one of my favorite auto magazines, *Car & Driver*, recently spelled out the phrase commonly truncated to "B.S." And this was in one of its headlines, no less!

➤ And speaking of complaints: Most of the protests concerning language appear on the little yellow survey cards that people fill out when resubscribing to the magazine. If you receive one of these cards, please don't hesitate to send in your comments. We do take them to heart. Based on the stated likes and dislikes of survey-takers, we've decided to monitor our language a bit more closely (boy, oh boy, you should see what we'd *like* to print), and provide more coverage of affordable upgrades. See next month's cover story for a whole slew of advice on power parts that won't break your bank.

➤ Interestingly, your survey cards have also instructed us to increase the frequency of babaliciousness in the magazine. No, you can't have Elizabeth's e-mail address, but if you send an e-mail to **input@maximumpc.com**, I'll forward it to Elizabeth, and hopefully get some responses in return.

Just keep it clean. (You know, the new language policy, and all.)

—JON PHILLIPS

Contents

Page 16

Page 56

Page 74

REGULARS

06 In/Out
OK, so we *don't* feel your pain… We'd still like to know your thoughts about the magazine.

10 Quick Start
PC previews, news, factoids… and the surprising number of "early adopters" who are running crap.

16 Head2Head
Believe it or not, there are two types of Tablet PCs, and odds are only one of them will win you over.

18 WatchDog
A casting call to all canines; VisionTek's new direction; and more news about the Fujitsu hard drive fiasco.

52 Ask the Doctor
The good Doctor's not only liberal with the prescription pad, but he's a skilled diagnostician and fixer of PC problems. What's *not* to like about him?

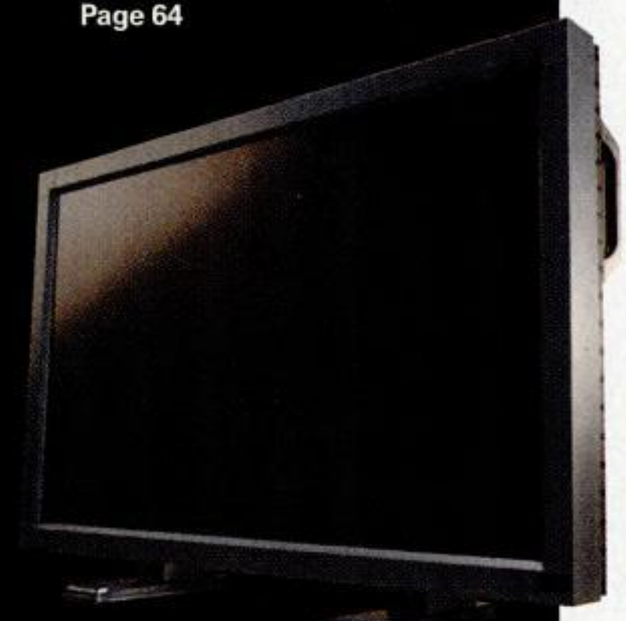
56 How To…
Make your own PC downright dreamy with our step-by-step primer to tricked-out cabling.

96 Rig of the Month
This month's case mod sports so many bells and whistles, you may need earplugs just to look at it.

REVIEWS

60 GMachines Omega PC
61 Sleekline 2800R PC
62 Fujitsu Lifebook P2120 notebook
63 Memorex DVD+RW/+R burner
63 Panasonic DVD-RAM/DVD-R MultiDrive II
64 Hewlett-Packard Media Center 883n PC
66 Logitech io Personal Digital Pen
67 M-Systems 32MB USB 2.0 DiskOnKey
67 Lexar 256MB USB 2.0 JumpDrive
68 NED LCD3000 monitor
69 DVD XCopy
69 ViewSonic AirPanel V110
70 Microsoft Plus! Digital Media Edition
70 GameDrive Optical Drive Emulator
72 SimCity 4
74 The Sims Online

Page 64



Page 68

Page 66

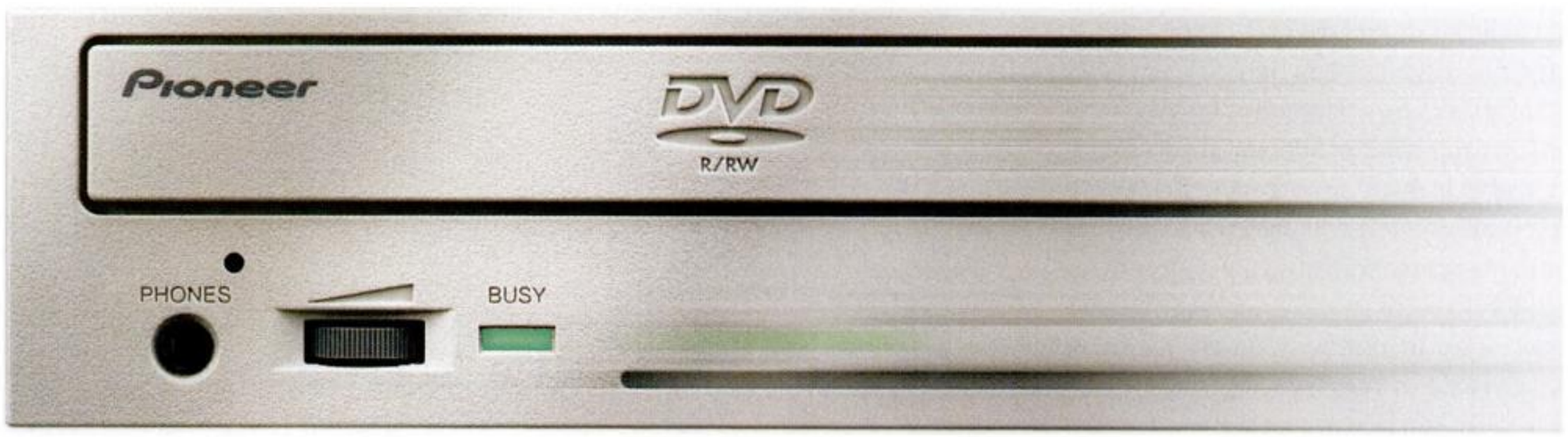
Copyrighted material

Pioneer sound.vision.soul

DVD R/RW

AV PC DVD R/RW COMPATIBILITY

DVD Forum world standards for AV/PC applications, DVD-R/RW provide compatibility with most existing DVD playback devices.



IN 1998, WE WERE THE FIRST TO LAUNCH. TODAY, WE'RE READY TO FLY.

Introducing the DVR-A05, Pioneer's new DVD Recorder with 4x speed. The company that introduced the first recordable DVD drive presents the next generation of DVD recorders. The DVR-A05 can record a full 4.7GB disc in about 15 minutes. In fact, it takes the kind of flawless performance that *PC World* magazine voted *"World-Class for 2002"* to a whole new level.* So if you'd like to fly through video or data recordings, log onto www.pioneerelectronics.com/dvdr.htm to find a reseller near you.

4X WRITE DVD-R

© 2002 Pioneer Electronics (USA) Inc. Business Solutions Division *2002 *"PC World* World-Class Award" was given to the DVR-A04 DVD recorder.

Copyrighted material

MAXIMUM PC

EDITORIAL
Jon Phillips EDITOR-IN-CHIEF
Katherine Stevenson MANAGING EDITOR
Gordon Mah Ung SENIOR EDITOR
Will Smith TECHNICAL EDITOR
Logan Decker FEATURES EDITOR
Greg Vederman DISC EDITOR
Andrew Sanchez EDITOR EMERITUS

ART
Natalie Jeday ART DIRECTOR
Boni Uzilevsky ASSOCIATE ART DIRECTOR
Mark Madeo PHOTO EDITOR

CONTRIBUTING ILLUSTRATOR
Richard Pepper

CONTRIBUTING EDITORS
Tom Halfhill, Brian Lam, Thomas McDonald, Tom McNamara

CONTRIBUTING WRITER
Scott Mueller

PRODUCTION
Richard Lesovoy PRODUCTION DIRECTOR
Lawrence Briseno PRODUCTION COORDINATOR

ADVERTISING
Chris Coelho PUBLISHER 415.656.8770
Bernard Lanigan EASTERN AD DIRECTOR 212.768.2966 EXT. 4001
Dave Lynn WESTERN AD DIRECTOR 949.360.4443
Stacy Levy NATIONAL SALES MANAGER 925.964.1205
Sharon Kiernan DIRECT SALES MANAGER 781.416.2018
Jose Urrutia ADVERTISING COORDINATOR 415.656.8313
Alison McCreery SENIOR MARKETING MANAGER 415.656.8364

CIRCULATION
Tina K. Rodich GROUP CIRCULATION DIRECTOR
Angela Martinez NEW BUSINESS DIRECTOR
Mimi Hall NEWSSTAND MANAGER
Janet Amistoso DIRECT MARKETING SPECIALIST

REPRINTS PRINT AND DIGITAL
Reprint Management Services
Maggie French, 717.399.1900 x178
mfrench@reprintbuyer.com

How to contact us:
All subscription Inquiries 800.274.3421 or maxcustserv@cdsfulfillment.com
Editorial staff input@maximumpc.com

future network usa
Media with Passion

FUTURE NETWORK USA
150 North Hill Dr. Brisbane, CA 94005
415.468.4684 www.futurenetworkusa.com

CHIEF EXECUTIVE Greg Ingham
PRESIDENT Jonathan Simpson-Bint
VICE PRESIDENT/CFO Tom Valentino
VP/EDITORIAL DIRECTOR Matt Firme
VICE PRESIDENT/CIRCULATION Holly Klingel
GENERAL COUNSEL Charles Schug
DIR. OF CENTRAL SERVICES Nancy Durlester

Future Network USA is aimed at people who have a passion. A passion for games. For business. For computers. Or for the Internet. These are passions we share. Our goal is to feed your passion with the greatest magazines, web sites, and CD-ROMs imaginable. We love to innovate, we love to have fun, and we have a cast-iron rule always to deliver spectacular editorial value. That means doing whatever it takes to give you the information you need. With any luck, we'll even make you smile sometimes. Thanks for joining us.

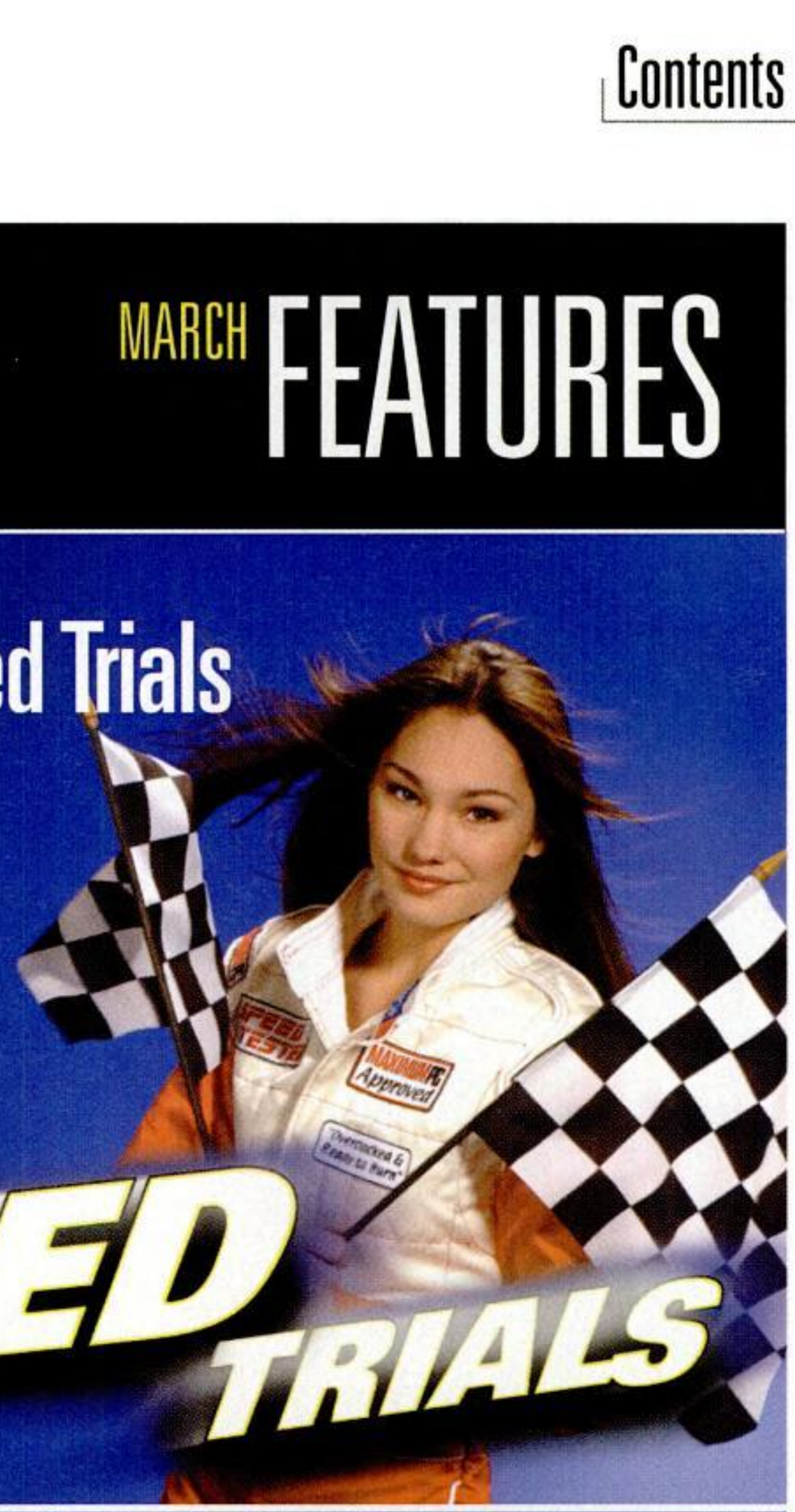
Future Network USA is part of The Future Network plc. The Future Network plc serves the information needs of groups of people who share a passion. We aim to satisfy their passion by creating magazines and web sites that offer superb value for money, trustworthy information, multiple ways to save time and money, and are a pleasure to read or visit. This simple strategy has helped create one of the fastest-growing media companies in the world: we publish more than 100 magazines, 20 magazine web sites, and a number of web networks from offices in five countries. The company also licenses 42 magazines in 30 countries. The Future Network is a public company quoted on the London Stock Exchange (symbol: FNET).

BATH LONDON MILAN MUNICH NEW YORK PARIS SAN FRANCISCO

MARCH FEATURES

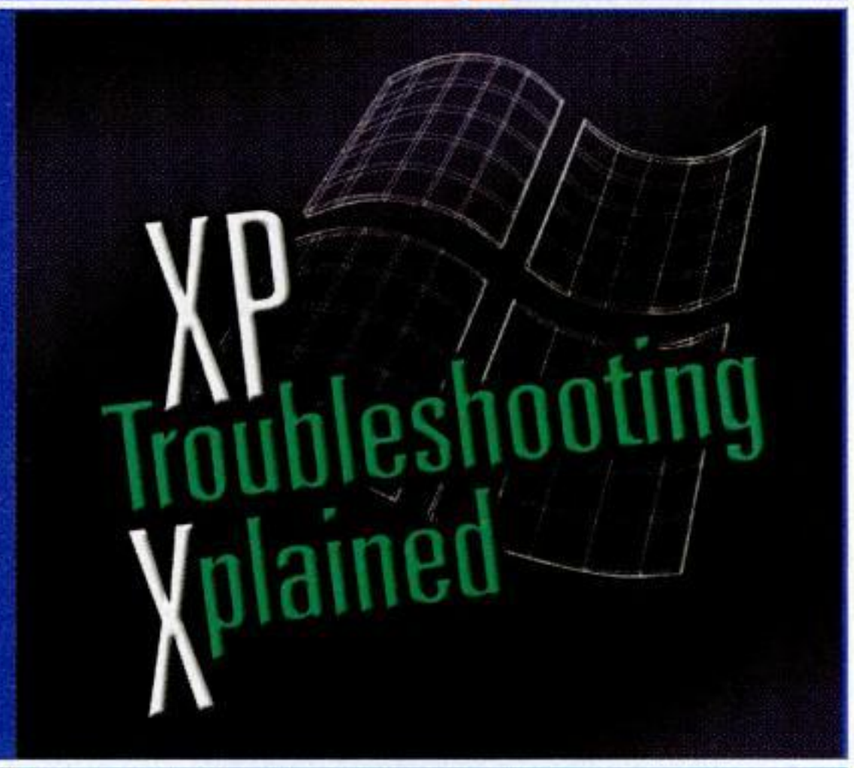
22 Speed Trials

Which PC technologies reign supreme? We benchmark a lab full of hardware to name the fastest! Video tech, hard drive tech, memory tech—we test it all. Plus, the last word on the Intel vs. AMD vs. Macintosh battle.



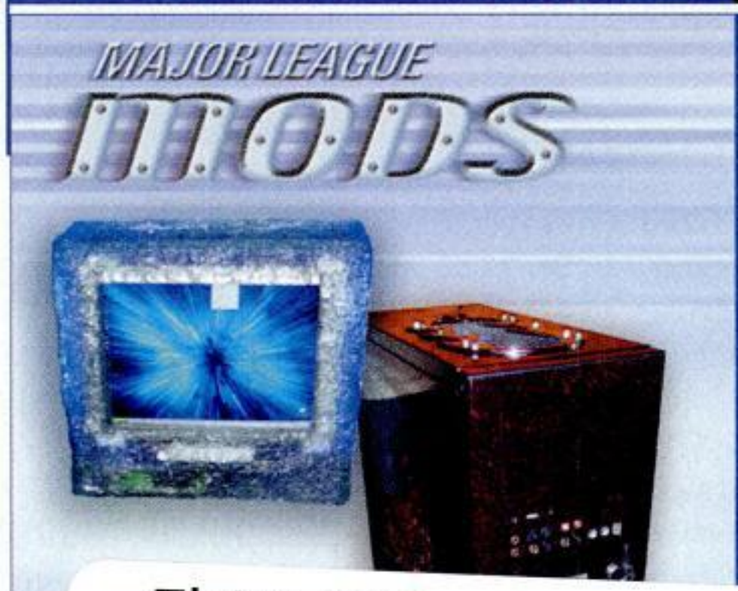
36 XP Troubleshooting Xplained

Last month, we took on troubleshooting your hardware. This month, we go into the OS for some deep Windows diagnostics. Don't be afraid—all will be revealed.



42 Major League Mods

They're wild, they're wacky, they're world-class case mods! You've gotta see the winners of this year's Consummate Case Contest.



This One
EF07-YLT-2TS8

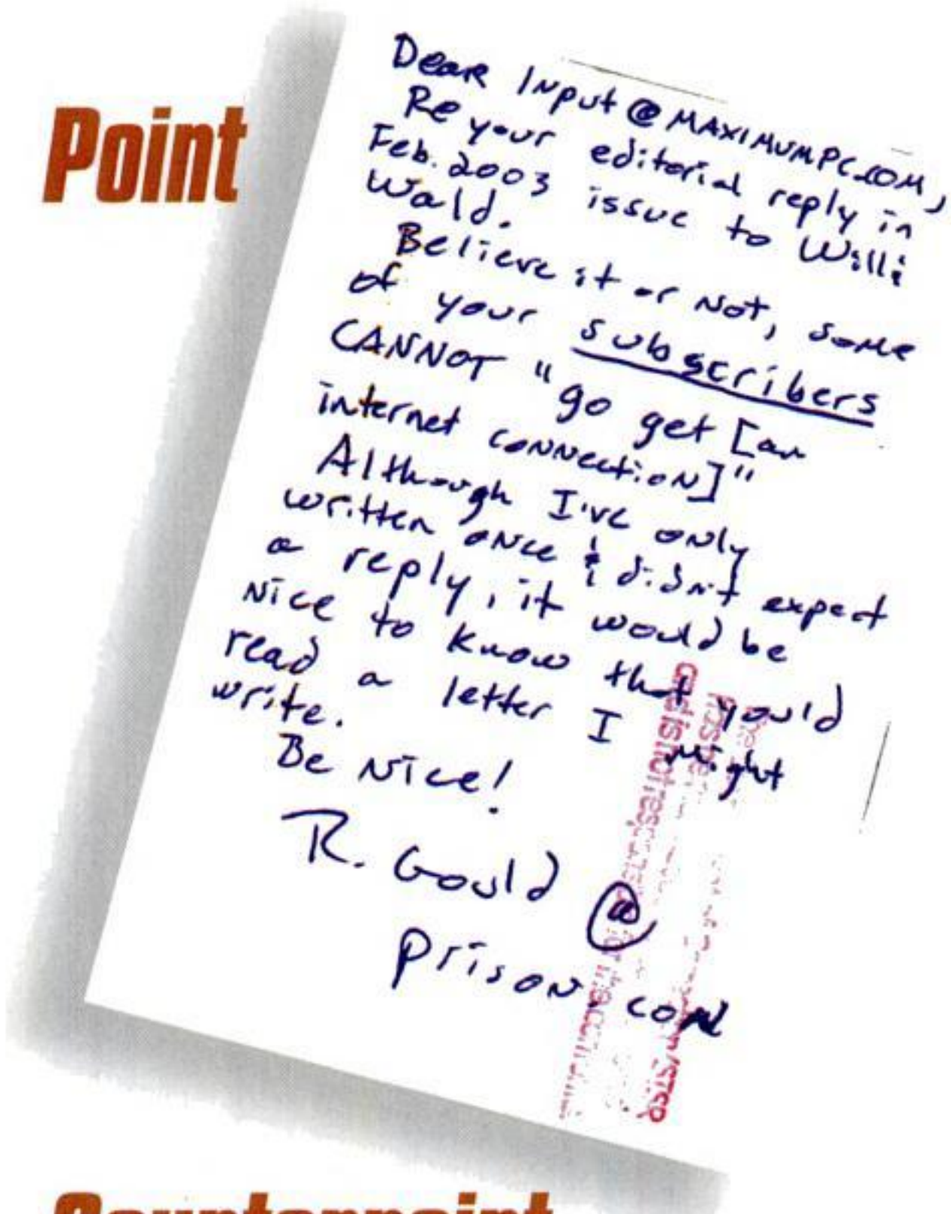
Copyrighted material

In/Out

You write, we respond

LETTERS POLICY: ***MAXIMUM PC*** invites your thoughts and comments. Send them to **input@maximumpc.com**. Please include your full name, town, and telephone number, and limit your letter to 300 words. Letters may be edited for space and clarity. Due to the vast amount of e-mail we receive, we cannot personally respond to each letter.

Point


Dear Input@MAXIMUMPC.COM,
Re your editorial reply in Feb. 2003 issue to Will Wald.
Believe it or not, some of your subscribers CANNOT "go get [an internet connection]"
Although I've only written once I did not expect a reply, it would be nice to know that would read a letter I might write.
Be nice!
R. Gould @
Prison.com

Counterpoint

I enjoyed the In/Out bit on your letter from the Canadian. He may be learned, thoughtful, and eloquent as you said. But the words that come to my mind are, "Canadian Crackpot." There. Is that short enough?

—DOUGLAS KNAPP

1:187.5 COMPRESSION RATIO

Scott Mueller's February "PC Fix-It Guide" was as wonderful as we would expect from him. Actually, it was even better, as he condensed troubleshooting down to eight easy-to-follow pages—from his 1,500-page book.

—STEVE KOHN

EDITOR-IN-CHIEF JON PHILLIPS REPLIES: Exactly! And truth be told, our secret reason for running the article was to educate readers on how they can educate themselves. Next time we receive a simple question regarding device drivers or STOP errors (we get about 100 each week), we'll simply redirect the letter-writer to Mueller's article, and go back to sipping Hurricanes at the swim-up bar.

HOW LOW CAN YOU GO?

I'm not sure if I missed a recent change in PC techniques or what. In Scott Mueller's February article on PC repair, the reader is directed to do a low-level format on a hard drive. I remember in the "old days," low-level formatting was sometimes done by the field technician, but this technique was not recommended for the newer (ATA/IDE) drives because it could actually render an otherwise good drive useless. Can Mr. Mueller clarify?

—LEWIS KAUFFMAN

SCOTT MUELLER REPLIES: The talk of an LLF (low-level format) rendering an IDE drive "useless" is a myth. As with most myths, it bore some truth, but only in the very first ATA drives of the late 1980s. Even those early ATA drives wouldn't be rendered useless by an LLF, but in some cases, non-optimal head and cylinder skew factors could be set, which could reduce the drive's overall performance.

However, none of this is possible on ATA drives that use what is called a zoned recording, where the number of physical sectors varies according to different zoned regions of cylinders on the drive. All ATA drives I've seen that are either more than 100MB in capacity, or which have been sold since 1990, use zoned recording, making them impervious to damage by LLF programs.

In fact, this presents another problem, in that a generic LLF program (as opposed to the drive-specific LLF program supplied by a drive's manufacturer) won't succeed in doing much to an ATA drive except overwriting all of the data on the drive with a test pattern—in essence acting like a "wipe" function. Because ATA drives use proprietary extensions to the ATA command set to control the remapping of defective sectors, only a manufacturer-supplied LLF program on an ATA drive can actually appear to "repair" bad sectors on a drive. So, while any LLF program will run on an ATA drive without damaging it, only the proper program from the drive's manufacturer will be able to "repair" the drive, which is of course the ideal situation.

HOT COOLER-ON-COOLER ACTION!

I read your February issue "Extreme Cooling" article and was wondering how much a Peltier cooler would help one of the water-cooled setups.

—ROCKY

CONTRIBUTING EDITOR BRIAN LAM REPLIES: Peltiers work off the principal that if two dissimilar metals have a current running through them, one metal will get hotter, and one will get colder. It's important to note that while a Peltier's cold plate can drop a CPU below ambient temperatures, it does so at the expense of getting the hot plate disproportionately warm. What's more, a Peltier system can sometimes demand as much electricity as a top-end Pentium 4.

Water-cooling kits have never been able to drop CPU temps below ambient, despite their ability to move heat quickly. By somehow pairing a water-cooler's ability to transfer heat and a Peltier's ability to drop temperature below ambient, one might have quite a setup. But electricity consumption would still be a significant problem.

WE'LL BE HERE ALL WEEK, FOLKS...

I'm an aspiring writer and musician, established weirdo, and former longtime reader of *Maximum PC*. My funds have been running a bit dry, and just the other day, while flipping through some back issues, I was met with a creative stroke. Just thought I'd share the results:

There once was a broken PC/The Dream Box it was not to be/Jon Phillips looked mad/And Gordon was sad/The rest of 'em said "Wasn't me!"

—ALEX SHAMKU

FEATURES EDITOR LOGAN DECKER REPLIES: *There once was a man named Shamku/Who made fun of the things that we do/Jon felt resentful/Gordon dissentful/But at least it wasn't haiku*

BENCHWARMING

I am always curious as to just how my rig compares with the equipment you test and benchmark. Are the benchmarking programs used by *Maximum PC* available to your readers? If so, can you include the benchmarks on a future Maximum CD?

—VINCE RESTIVO

Copyrighted material

MADE WITH NO

LIMITS IN MIND

ALL-IN-WONDER® 9700 PRO

It's the ultimate light and sound show for your PC.
ALL-IN-WONDER® 9700 PRO gives you the ultimate home entertainment experience on your PC. Get industry best 3D graphics, time shifting TV tuner, video editing capabilities and radio frequency remote control matched with Direct X® 9.0 support for superior video realism in your 3D games. Plus, get incredibly crisp video during DVD and streaming video playback. Let the performance begin!

ATI.COM

Copyright 2002, ATI Technologies Inc.
All rights reserved. ATI and ALL-IN-WONDER are trademarks and/or registered trademarks of ATI Technologies Inc. All other company and/or product names are trademarks and/or trademarks of their respective owners.

Copyrighted material

YOU WANT SOME OF THIS?

COMING NEXT MONTH

IN THE APRIL ISSUE OF MAXIMUM PC

BUDGET UPGRADES FOR POWER USERS

So you want a power-user's rig, but you don't have a power-earner's salary? No problem! *Maximum PC* has the most comprehensive guide ever to picking the best PC components for the least amount of money. We'll show you the best power values in each parts category, compare a bunch of sub-$1,000 notebooks, and even review the cheapest PC we can find. You'll also get a 10-step guide to finding and buying parts online without panic or fear.

ATHLON XP CHEAT SHEET

AMD's new Athlon XP 3000+ processor is ready to roll. Armed with twice as much cache as the 2800+, the "Barton" CPU competes neck-and-neck with the Pentium 4 (see page 33 in this issue). But what's the story if you want to buy a Barton system or build one yourself? We answer all your Barton questions in next month's issue .

POCKET PC GAMES!

What's better than fun? Why, fun on the run, of course. Games for your Pocket PC have evolved from pathetic variations on *Tetris* and *Pong* to encompass virtually the same breadth of genres as their desktop counterparts: real-time strategy, action/adventure, shooters, and platformers. We play and rate the coolest Pocket PC games, including the full version of the original *Tomb Raider* ported to the iPaq, and arcade/console emulators!

PLUS, A MAXIMUM PC EXCLUSIVE...

MY LITTLE MOBO!

SENIOR EDITOR GORDON MAH UNG REPLIES: Unfortunately, only one benchmarking program in our entire test suite is freely available to readers: FutureMark's *3DMark2001 SE*. And even that program doesn't let you run the same benchmark that we run, as you have to pay for the Pro version to break out individual scores (we typically publish Game 4 scores). *SYSmark2002* costs $200. We can't put it on our disc, but you can buy it from FutureMark.com. Our Adobe *Premiere* action script requires use of the full version of the program, and the test file for this test is 316MB. We can't put either *Premiere* or the test file on the disc for obvious reasons. Our *AudioGrabber* test requires a full Tori Amos music CD. You get the point: Price, copyright, and disc space considerations make it impossible to put our benchmarks on the Maximum CD.

IBM? HAH!

I can't believe you would actually rate the new 180GXP IBM drive a 10 [February, 2003]. Quality control at IBM is apparently nonexistent, as evidenced by the 60GXP fiasco. By comparison, Western Digital drives are for all intents and purposes bulletproof. I think you really sat on a tack with this review. If your response is to note that you rate the drives only on performance, without considering the manufacturer's ability to put out reliable hardware, don't bother. I find that line of reasoning to be specious in the extreme. Your magazine is one of the sources I look at when making a decision on hardware to purchase or recommend. I need the whole picture. PU, el stinko, to you.

—JR RICHARDSON

THE MAXIMUM PC WATCHDOG REPLIES: Actually, the real fiasco was IBM's 75GXP, and Fujitsu's MPG hard drive might even prove to be a more troubled product, overall.

When we reviewed the 120GXP in our May 2002 issue, we thought long and hard about how much IBM's el stinko 75GXP should factor into the 120GXP's score. We ultimately decided that it would be unfair to put the sins of the father on the son. The same holds true for our coverage of the 180GXP in last month's issue: We can't indict a piece of hardware for a crime it hasn't yet committed. We'll also point out that we can't judge the reliability record of millions of drives based on our experience with a single unit, so our only recourse is to pay attention to reader reports. The Watchdog has received absolutely zero complaints about reliability problems with the 120GXP, so we think IBM (whose hard drive business is now owned by Hitachi) has fixed its problems.

We have never skirted IBM's drive problems. In fact, we believe *Maximum PC* was the first news source to break the story in print.

OEM-BASHING, BATTER-UP

I would like to comment on the one thing that Jon Phillips did not talk about in his February "Release Notes" on pre-fab PCs. He failed to mention that most people do not buy the best of the factory-built PCs. Instead, they buy a Yugo from a Ferrari dealer. Most pre-fabs sold are bottom-line, meaning built-in graphics, Celeron processors, minimum memory, no AGP slot, and inadequate cooling. I have replaced more hard drives in factory-built PCs than I care to mention. So the answer is: If you owned an expensive sports car and it stayed in the shop all the time, you wouldn't prefer factory-built either.

—ROBERT WILLIAMS

SECOND BATTER, DRIVE 'EM HOME!

Regarding the February editorial on pre-fab PCs, I believe that big OEMs can never truly understand what hardcore computer enthusiasts really want in a computer. I live by this mantra: Since everyone is different, so should their computers be. Simple. I loathe the idea of going out to a CompUSA or Circuit City to purchase a computer that was manufactured in some warehouse, by some guy who only learned enough from some no-name trade school to put together a computer.

I also believe Alienware sold their souls when they decided to have Best Buy carry its computers. I remember a time when having the only Alienware on the block was considered "godlike," but now anyone can go to the local Best Buy and purchase the newest model without any hassle of choosing parts. Sorry to say this, but I will now start bashing Alienware.

—DUANE JEFFERS

ONE MAN IN, THEY'RE GOING FOR A BIG INNING

Alienware's new Predator PC [February, 2002] certainly looks nice,

Copyrighted material

but if you hadn't told me that it was inspired by the works of H.R.Giger, I would never have guessed it. Rounded sides and a couple of simple black radiator grills make this a Giger-inspired PC? I think not. To me, the Predator looks more like a cross between a Toyota Prius and a Sharper Image ionic air purifier.

—MARK JAMESON

AND THE RALLY FIZZLES...

Is it just me, or can you guys also see the resemblance between Alienware's "Project Predator" and those oboe-playing aliens from *Star Wars*? It looks like it could be a helmet for them.

—GABRIEL FRANCO

EDITOR-IN-CHIEF JON PHILLIPS REPLIES: It's just you.

SUSPECT DECISION

I was really looking forward to reading the "Unusual Suspect" case roundup in the January issue, but my enthusiasm was dampened considerably when I saw how badly Omeed Chandra dropped the ball by not including a single model from Lian Li. Sad too, because even the PC-60, Lian Li's most popular model (for modders, anyway), contains every feature that was highlighted in the article's winner, the Cooler Master ATC-101 (with the exception of the goofy front fan design). Drive installation is way easier in the Lian Li, and the single-connector pigtail makes mobo wiring easier than with any other case on the planet. Finally, it comes at a price that's about a C-note cheaper than the Cooler Master.

You guys are probably flogging Omeed for his unforgivable omission because I know from your magazine content over the years that most of you guys are Lian Li fans.

—BOB HOVEY

SENIOR EDITOR GORDON MAH UNG RESPONDS: We didn't flog Omeed, we just sent him away to college. (Our former intern is now studying electrical engineering and computer science). It's actually my fault that we didn't have a Lian Li case. It was a simple oversight that we didn't collect a Lian Li case for the roundup.

Of course, I must also point out that we also didn't include cases from dozens of other enclosure manufacturers. In any roundup, you simply can't have representation from every manufacturer. But judging by the amount of Lian Li fan mail we received, I'm sure we'll include one in the next roundup.

SPAM, SPAM, SPAM, SPAM...

Your recent article on spam was illuminating, but omitted mention of one very effective piece of freeware from New Zealand. It is *Mailwasher* and I would suggest you check it out: **www.mailwasher.net.**

—JAMES BOGIN

SPAM, SPAM, SPAM, SPAM...

I would like to say that your January article on spam was detailed, but fairly standard. I have done my own research on spam prevention, and have found a useful web site called Spam Gourmet (**www.spamgourmet.com**). This site has free e-mail forwarding by way of disposable e-mails. This site is very useful if you know that you only want to receive a few e-mails from a particular site or person.

—-DEVIN SEVILLA

SPAM, SPAM, SPAM, SPAM...

I can't believe you guys forgot a couple fantastic anti-spam tools in your January article. The most exciting development in anti-spam technology in 2002 was the creation of Bayesian filtering tools. I'm too stupid to understand the math, but from a practical perspective, you train a Bayesian filter over time and it learns what is spam and what is not. It is very effective, very accurate, and as time goes by, it only gets better at its job. After using a Bayesian filter for a week or two it will accurately identify and sort spam about 99 percent of the time, depending on your volume of e-mail. Check out *POPFile*, an open-source and free Bayesian filter tool, at **http://popfile.sourceforge.net.**

Another great open-source tool is the *Tagged Message Delivery Agent*. This tool is installed on the mail server itself and acts as a whitelist/blacklist gateway. It's difficult to describe everything is does, but I'll hit on the main thing I use it for: When someone sends me an e-mail for the very first time, *TMDA* holds it in a queue and sends the original e-mail sender a message. The message informs him that he has to send a reply back to confirm he's a real person and not some godforsaken spam bot. Once the reply is received, the original message is delivered, and the sender is permanently added to my whitelist. I have found that *TMDA* is 100 percent effective and have not had a single piece of spam e-mail in my inbox since I installed it nearly a year ago. Not one.

—DOUG DIMICK

"We need to slowly feed him into an industrial meat grinder, feet first, while giving him a transfusion of pigs blood..."

SPAMMITY SPAM, WONDERFUL SPAM!

It's no wonder Mr. Scelson [the "Spam King" profiled in January] has received death threats. Simply put, his life is not worth the damage he is inflicting on society. If we added up all the time that people spent dealing with spam, and put that time to good use, we would be able to solve all sorts of problems. We need to slowly feed him into an industrial meat grinder, feet first, while giving him a transfusion of pigs blood to replace whatever it is that's running through his chicken-sh*t veins.

— SANDRA STARR

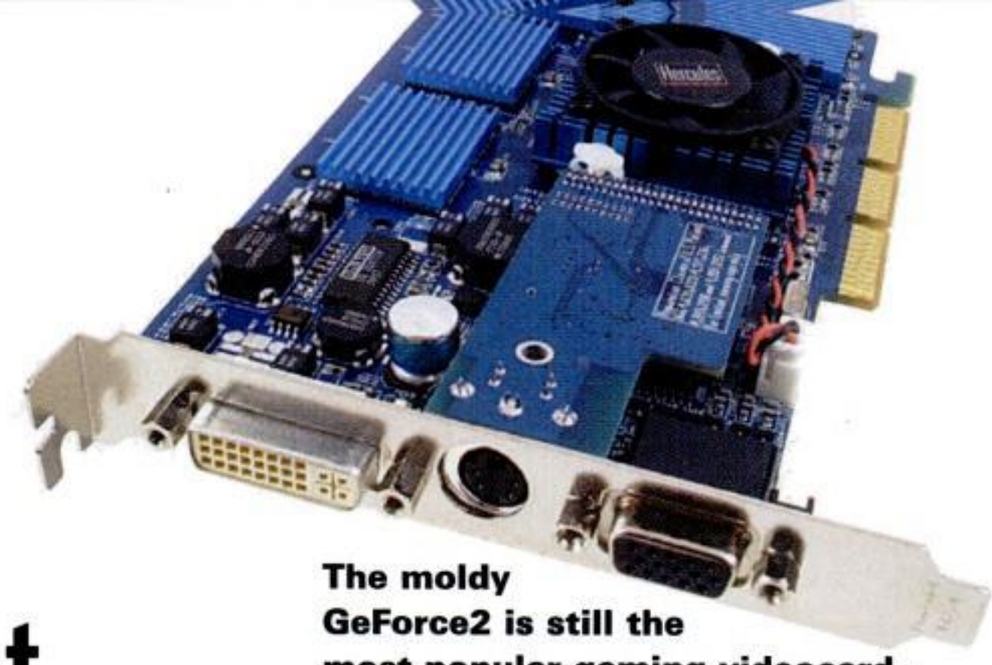
CUT, COPY, PASTE

➤ In our February "Extreme Cooling" feature we listed the wrong URL for Prometia. The correct URL is www.chip-con.com/cooler.asp.

Copyrighted material

Quick Start

The beginning of the magazine, where articles are small



The moldy GeForce2 is still the most popular gaming videocard—according to FutureMark's database.

Survey Says: You've Got Ancient Hardware!

FutureMark reveals the shocking truth about gaming PCs

A horrifying new report issued by the benchmarking company FutureMark shows that the average gamer's hardware configuration wouldn't rate a 4 verdict in *Maximum PC*. The findings are scandalous but not surprising. While PC gamers were willing to shell out $200 for a new OS in 2002, many seem to have deferred on component upgrades.

At least that's one possible interpretation of the report, which profiles the rigs of roughly 770,000 people that FutureMark classifies as "early adopters" (that is, people who buy hardware before the general public does). FutureMark has two novel ways of collecting detailed information on individual rigs. First, whenever someone uses the free version of the *3DMark2001 SE* gaming benchmark suite, the hardware profile of the system being tested is collected by FutureMark and fed into a database. Similarly, FutureMark records the hardware profile of any machine that runs Performance Analyzer, a web-based service that helps people gauge their systems' potential gaming performance (you can find Performance Analyzer on the web sites of game publishers and hardware vendors).

Looking at the report, it's no wonder that game publishers are so reluctant to sell titles that use pixel and vertex shaders. Out of the 770,000 or so machines profiled in the FutureMark database, the number of rigs running GeForce2 cards exceeds the combined total of rigs running GeForce4, GeForce3, and Radeon 8500 cards. In fact, more than a third of all rigs had video subsystems with just 32MB frame buffers, while another third had 64MB buffers. Only a mere 8 percent of rigs in the database had 128MB cards.

The proliferation of nVidia graphics is manifest in the list, with 14 of the 20 most popular video chips listed in the database bearing the nVidia logo. But ATI has something to boast about, as well. Even though FutureMark's four-month reporting period was closed in late September, no fewer than 553 Radeon 9700 Pro cards were logged into the database—and these cards didn't officially go on sale until September 30. Far fewer gamers were running Matrox cards, however. Of all the PCs surveyed, only 91 were running Parhelias. In fact, three times as many people were running the Matrox Mystique, a product that's been off the shelves since the 1990s!

Only a small minority of the graphics subsystems recorded by FutureMark were integrated into mobo chipsets, and most of the integrated jobbies were fused into Pentium III 810 and 815 chipsets. Because there's virtually no Pentium 4 integrated chipsets on the list, it's easy to surmise that while the P4 wasn't the top CPU recognized by the database, the overwhelming majority of P4 owners were at least running add-in graphics cards. A lack of integrated Athlon chipsets on the list indicates that the same can be said of AMD.

All of which leads us to the CPU distribution of the PCs studied by FutureMark. Neither the Athlon XP nor the P4 led the way. Instead, the typical gamer's darling was the Pentium III, with most of its frequencies falling in the 700MHz to 1GHz range.

The FutureMark study doesn't detail the type of RAM in each system, but 45 percent of the PCs surveyed had between 256MB and 511MB of RAM. About 20 percent had from 128MB to 255MB, and another 26 percent had 512MB to 1023MB. Just 2 percent had 1GB or more, and about 226 mad hatters had 2GB or more.

Though most of the hardware configs in the database were woefully underpowered, an incredible 49 percent of rigs surveyed were running Windows XP. Only 23 percent were running Win98, and 14 percent were sold on Win2000. Windows ME, which had a bad rap with most PC users, came in dead last with 13 percent.

The survey reflects the hardware habits of the general gaming community—not, thank heavens, the readers of *Maximum PC*. To get a better idea of the hardware our readers are packing, we'll be partnering with FutureMark to create a custom Performance Analyzer and survey for our readers. Expect to see this automated survey on Maximumpc.com in the coming months.

Although the survey illustrates two years of slow sales for the PC industry, there is a silver lining: Gamers can't run old hardware forever, and the antiquity of the machines in the survey shows that 2003 may be a bang-up year for gaming hardware vendors.

Top 10 Videocards in Surveyed PCs

GRAPHICS CHIPSET	NUMBER	PERCENTAGE
1. NVIDIA GeForce2 MX/MX 400	144,906	19%
2. NVIDIA TNT2 M64	83,682	11%
3. GENERIC VGA	46,872	6%
4. NVIDIA GeForce4 Ti 4200	44,438	6%
5. NVIDIA GeForce3 Ti 200	42,193	6%
6. NVIDIA GeForce2 MX 100/200	36,734	5%
7. NVIDIA GeForce2 GTS/Pro/Ti	33,087	4%
8. NVIDIA RIVA TNT2/Pro	22,045	3%
9. ATI Radeon 8500	20,077	3%
10. NVIDIA GeForce4 Ti 4600	19,759	3%

The videocard list backs up FutureMark's contention that the report chronicles early adopters as opposed to budget-minded folks: Only a small minority of the graphics cards in the survey were integrated into mobo chipsets.

Top 10 CPUs in Surveyed PCs

CPU	NUMBER	PERCENTAGE
1. INTEL PENTIUM III	185,446	25%
2. INTEL PENTIUM 4	140,560	19%
3. AMD ATHLON	126,273	17%
4. AMD ATHLON XP/MP/4	115,966	16%
5. INTEL CELERON	57,136	8%
6. AMD DURON	43,505	6%
7. INTEL PENTIUM II	27,966	4%
8. AMD-K6 3D PROCESSOR	19,986	3%
9. UNKNOWN	10,536	1%
10. INTEL PENTIUM	4,883	1%

While Intel may be the proc of choice for business desktops, it has a surprisingly slim cumulative lead over AMD for gamers' boxes.

Copyrighted material

A Giant Step Forward For Digi-Cams?

Foveon X3 technology triples color sensitivity

Despite ever-increasing resolutions, digital cameras still lag behind film cameras in terms of image quality. And most digi-cams, truth be told, lag *way* behind. But Foveon, Inc. has introduced an image sensor that aims to match the color fidelity of film cameras by capturing light in much the same way as the human eye.

The Achilles' heel of digital cameras is the way in which their optical sensors record light. Typical digi-cams, just like scanners, use the additive color system to reproduce images. They start with the absence of color, and add the primary colors (red, green, and blue) to create the visible color spectrum. But today's image sensors have only a single layer of photodetectors—one cell for each pixel—and each of these cells is only capable of picking up a single color. As a result, each cell throws away two-thirds of the available color information. To compensate for this loss, even high-end, super-ultra-megapixel digital cameras use interpolation—the hideous enemy of image quality. With interpolation, color values are sampled from surrounding pixels to "guess" at the missing color information for each pixel, leading to unsightly artifacts, as seen in the first image to the right. Blur filters can minimize the artifacts, but at the cost of detail, as seen in the second image.

Foveon has developed the first image sensor that captures the red, green, and blue values for each pixel. The technology uses three layers of photodetectors embedded in a silicon substrate, effectively tripling the color information for each pixel. Another advantage, Foveon says, is that its technology doesn't require heavy processing in the camera to fill in missing colors.

The first camera to use Foveon's X3 technology is Sigma's SD9 (**www.sigmaphoto.com**). It retails for (cough) $1,800, and doesn't even include a lens. Foveon says, however, that it's "actively engaged" in developing partnerships with other camera manufacturers.

The first image was taken with a traditional digital camera, and shows heavy artifacting. Blur filters minimize the flaws shown in the second image, but at the cost of detail. Foveon's X3 lens, doesn't need to resort to workarounds to capture sharp detail without artifacts, as seen in the last image.

FAST FORWARD BY TOM R. HALFHILL

Desktop PCs: Tomorrow's Clunkers

Within 10 years, today's desktop PCs will seem as old-fashioned as the room-sized mainframe computers of the 1960s. Almost nobody will want a PC that isn't portable and wireless. Our ponderous towers and snarls of cables will be the obsolete "big iron" of tomorrow. But this isn't necessarily a good thing if you're the kind of PC hot-rodder who reads this magazine.

Look at the trends. Desktop PC sales are flat, while mobile-PC sales are growing about 15 percent a year, accounting for about a third of all new PCs. Even when the economy recovers, it will be obvious that the greatest growth years of desktop PCs are behind us. PCs are going mobile for the same reasons as phones, stereos, and other appliances: People want to work and play anywhere, freed from the leash of power cords and phone lines. When I was a teen, a monster stereo was a status symbol. Nowadays, most youngsters would rather have a notebook PC in their backpack, an MP3 player in one pocket, and a cell phone in the other.

Intel is pumping up a huge marketing campaign for its new Centrino "mobile platform," which includes the Pentium M (Banias) processor. Yet Intel already has 84 percent of the mobile CPU market. Why spend millions of dollars buying a few more percentage points of market share? Because Intel loves it when somebody replaces a desktop with a laptop. Mobile CPUs have higher prices and profit margins than desktop CPUs. Ditto for mobile PCs vs. desktop PCs. Also, people tend to replace notebooks more often, partly because they're more prone to breakage and theft.

This year, the number of new notebooks with Wi-Fi will surpass 50 percent (this figure is accelerated by Centrino, which will soon integrate Wi-Fi in the system chipset). The number of public Wi-Fi hot spots is expected to surge from 15,000 today to 300,000 by 2006. Once people get used to anytime/anywhere Internet access, desktop PCs will seem as clunky as hand-cranked telephones.

This could be bad for hardcore enthusiasts, because notebooks inevitably sacrifice performance and easy customizing for portability. They don't have roomy expansion slots and drive bays. Their thermals are restrictive, making overclocking more difficult, especially with no room for extra fans. Case mods can't be as radical without compromising mobility. And you might be reluctant to lavish thousands of dollars on a dream machine that's easier to rip off or break.

Maybe we'll find ways around these problems. Maybe some vendors will make notebooks designed for customizing. If not, they'll have to pry our kick-ass desktop PCs from our cold, dead fingers.

Tom Halfhill was formerly a senior editor for Byte *magazine and is now an analyst for* Microprocessor Report.

Copyrighted material

FUN-SIZE NEWS

Introducing xD

Digital camera manufacturer Olympus paired up with Fujifilm of Japan to develop yet another type of nonvolatile flash memory called xD (for "eXtreme Digital"). Although not much smaller than the extant SD/MMC format currently used in many digital cameras, and only available in capacities up to 256MB (compared with 512MB for SD/MMC), the xD cards should be able to hold as much as 8GB in the future, according to Olympus.

The Guildhall Game Level Design School

You can't quite get a master's degree in Game Mods yet, but Southern Methodist University in Dallas, TX, has announced an 18-month certificate program in game development. Called the Guildhall at SMU, the program focuses on three fields of game development—Art Production, Level Design, and Software Development—with a curriculum developed by industry heavies such as Richard (Levelord) Gray, John Romero, and Graeme Devine.

RIAA and BSA Dump DRM

The Recording Industry Association of America and the Business Software Alliance, after months of saber-rattling, have decided to bilaterally chill out on the issue of digital rights management. The *New York Times* reported that the RIAA has agreed not to pursue legislation mandating hardware DRM on personal digital devices, while the BSA pledged not to support legislation expanding the consumer rights over digital copyrighted music. Now that we know what they *won't* do, we're eager to find out what they *will* do. No word on that yet from either group.

Intel Announces the Centrino Mobile Proc

Intel will name its new mobile CPU, core-logic chipset, and wireless-controller combo the Centrino. Said to be a synthesis of the words *center* and *neutrino*, the Centrino is Intel's way of getting power into small notebooks while preserving battery life and wireless functionality. So just what CPU is packaged with the Centrino? Intel says it's a "Pentium M." *Hmm.*

The chip was previously code-named Banias and was designed by the same team that worked on the ill-fated Timna. Timna, an all-in-one CPU/chipset, was never introduced to the market.

HELPFUL HINTS

New Year's Resolutions!

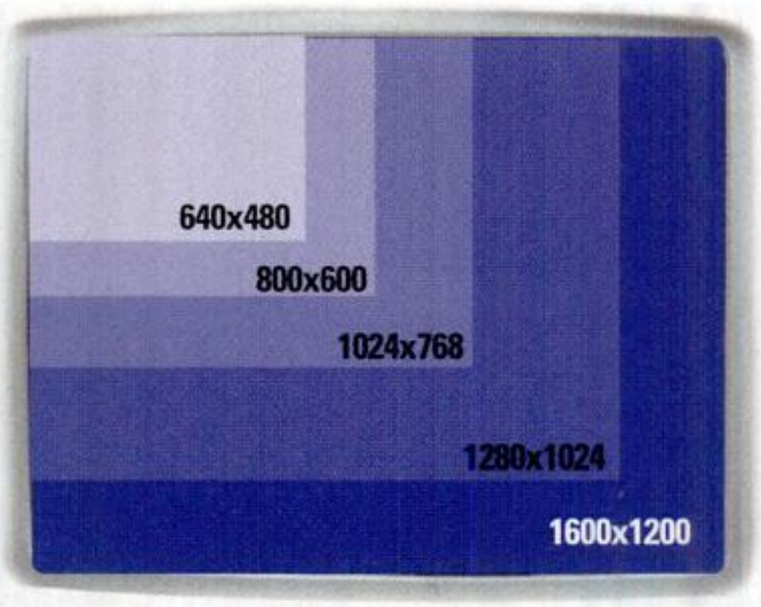
Cheat Sheet: How HDTV stacks up to PC and TV screens

The question surrounding HDTV is no longer *if*, but *when*. According to the FCC, that would be 2004. That's the deadline by which all new TV sets, 36-inches and larger, must include digital tuners inside. What's more, *all* TVs will have to have built-in digital tuners by 2007. What's the rush? Will the series finale of *Buffy* be topless?

No, the Feds are just trying to kick-start a fledgling technology. But just describing HDTV as "sharper" and "more detailed" isn't particularly exciting—no wonder they have to push it so hard. So we've done a pixel-for-pixel comparison of PC monitor, television, and high-definition television standards so you can see exactly how much more real estate you can count on getting.

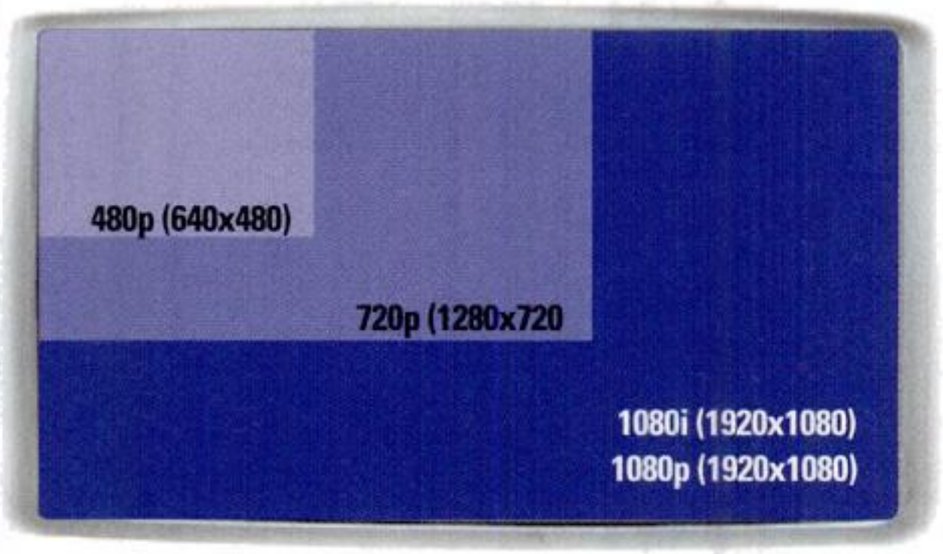
TV

Yes, some Japanese televisions can deliver 720x480 screens, but most of us are stuck with 440x480. Blow this resolution up to full-screen on a 21-inch monitor, and it will look like a bunch of Lego blocks mud-wrestling in the twilight hours.



PC

Pixel for pixel, PC monitors already support resolutions equivalent to HDTV broadcasts. In fact, with a 1920x1200 native resolution, Apple's 23-inch Cinema HD display can deliver even more pixels than HDTV.



HDTV

These are the four standard resolutions for High Definition televisions. The little "i" refers to "interlaced," meaning that half the screen's scanlines are drawn alternately with each refresh. The little "p" stands for "progressive scan," which draws all the lines on each refresh, resulting in a clearer picture.

The world's largest television set is Sony's Power Tron TV in Tokyo, Japan. It measures 150x80 feet and cost $17 million to make. It does not support HDTV.

Copyrighted material

CES Gadgeteria!

Cool gadgets fresh from the techno hopper

Every year, manufacturers descend on Las Vegas to show off the latest and greatest in high-tech at the Consumer Electronics Show (CES). It's a Gladiator-like spectacle, as competing companies vie for attention from booth to booth. But not every company needed a hottie PR rep or "booth babe" to catch our eye. Here's a look at some of the most luscious gadgetry from the show floor this year.

MICROSOFT SPOT WATCH

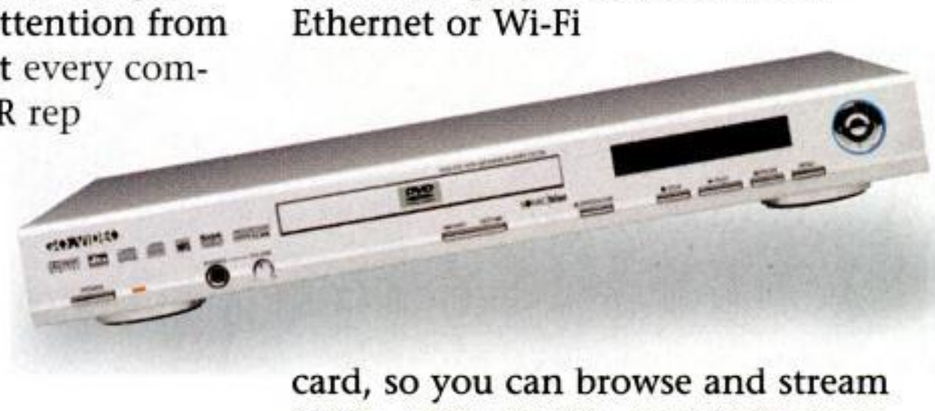
It's time to retire your beloved calculator watch. Microsoft and Fossil are teaming up to bring wireless data to your wrist. So instead of merely gleaning the time from your watch, you'll

also be able to find out the latest CNN headlines and learn how much longer that storm will brew over Truth or Consequences, NM. SPOT, or smart personal objects technology, is based on an embedded, low-power wireless receiver and a CPU jointly developed by Microsoft Research and National Semiconductor. Existing FM broadcasters will be supporting SPOT devices in more than 100 U.S. and Canadian cities via an FM subcarrier network Microsoft calls DirectBand.

WHERE: www.fossil.com
WHEN: Summer 2003
HOW MUCH: They're still thinking about it

SONICBLUE GOVIDEO D2730 NETWORKED DVD PLAYER

Tired of hunching over your PC to watch MPEGs and listen to MP3s? SONICblue's new D2730 progressive scan DVD player uses a PCMCIA Ethernet or Wi-Fi



card, so you can browse and stream MPGs, JPGs, WAVs, and MP3s from your PC to your living room with the DVD player's remote. Rumor has it that SONICblue is also developing a variant of the D2730 that will stream beer and popcorn over Ethernet to your living room from your refrigerator.

WHERE: www.sonicblue.com
WHEN: Q1 2003
HOW MUCH: $250

RCA LYRA

The very first video-enabled portable media players sported LCDs a little bigger than a postage stamp. The RCA Lyra portable Audio Video Jukebox, however, offers a palm-filling 3.5 inches of LCD real estate. The new Lyra inhales your MP3s and digital video via USB 2.0, and can even capture new AV clips using the composite-in. Why settle for listening to

Britney MP3s on the bus when you can watch her gyrate on the Lyra?

WHERE: www.rca.com
WHEN: Summer 2003
HOW MUCH: $400

GAME THEORY

BY THOMAS L. McDONALD

It's Neither Innocent Nor Fun

The Sims has always had a dark underbelly. When I first wrote of it in this space three or so years ago, I reveled in the details of how to torture a Sim by leading his spouse into an affair or removing the bathroom.

But ... they were just Sims: blocky polygonal characters controlled by a fairly effective AI. *The Sims Online*, on the other hand, is less about manipulating virtual life than it is about interacting with real people, and that changes the entire balance and tone of the game. As I point out in my review this issue (see page 74), it does so to the detriment of the gameplay. But it nonetheless raises curious moral and ethical questions.

In *The Sims Online*, the designers have replaced building and creation with a kind of forced social interaction, with gamers having to find "roommates" and pool money in order to afford a house. I can't even imagine the logistics involved in separating from a roommate, but I can imagine the kind of social world that may evolve, and it's frankly rather disturbing. In *The Sims Online*, couples can meet, hook up, move in together, and begin virtual lives. But this isn't a virtual life that involves slaying orcs, for instance. It's a virtual life that replicates a real life. There's something innately perverse in recreating the suburban experience in miniature with an actual human being who is also living a quite real existence in another part of the world. While he's trying to find the best way to simulate sex with his new Sim wife, his real spouse is in the other room reading to his real kids.

EA/Maxis must find this at the core of the game's appeal, since one of their two high-profile television ads shows a (rendered) Sims couple getting married. After the Sim groom carries off his new bride, they spin around to reveal their true identities: He's a typical teenage geek, she's Selma Blair. "Brace yourself," Selma says as she pushes the kid away. "The Sims are real." In the distance, the pathetic kid says "Call me!" That's the appeal and the problem in a tidy little nutshell.

Already, large portions of the game seem to be dedicated to hooking up, sex, and sexuality, with a disproportionate number of gay-themed homes that seem largely dedicated to going private for hot chat. Parents can easily block out IRC or AOL chat rooms, but what are they to make of kids playing a seemingly wholesome game like *The Sims* in an online realm populated by potential perverts?

This time, the Sims certainly are real, along with all the unexpected and often scary elements that make up much of modern life.

Tom McDonald has been covering games for countless magazines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.

Copyrighted material

The entertainment server.
It won't change your life.
Just the part of it you spend at home.

FACTORY

Personal computers have always been a solitary lot. Not anymore. The Sony VAIO PCG-RZ26G, powered by the Intel® Pentium® 4 Processor, has no interest in working alone. It's the foreman of your home entertainment crew. The VAIO PCG-RZ26G burns CDs and DVDs, edits home movies, downloads music

fresh

VAIO® PC PCG-RZ26 | HOME ENTERTAINMENT SERVER | INTEL® PENTIUM® 4 PROCESSOR

©2003 Sony Electronics Inc. Reproduction in whole or in part without written permission is prohibited. All rights reserved. Sony, Roomlink and VAIO are trademarks of Sony. Intel, the Intel Inside logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are trademarks of Microsoft Corporation. Certain software product(s) included with this computer may include features such as copy protection and content management technology. USE OF THE SOFTWARE PRODUCT(S)

Copyrighted material

and even captures TV broadcasts. And pairing it with the RoomLink™ network media receiver's GUI makes it easy to share a warehouse full of PC content with your home A/V components.[1] Your foreman is now on the clock. Let the entertainment begin. **www.sony.com/fresh**

SONY

SONY RECOMMENDS MICROSOFT® WINDOWS® XP

[1] REQUIRES AGREEMENT TO APPLICABLE END USER AGREEMENTS AND FULL COMPLIANCE WITH APPLICABLE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and privacy policies will be detailed during initial launch of the software product(s), or upon certain reinstallations of the software product(s) or reconfigurations of the computer, and may be completed by Internet or telephone (toll charges may apply). Preinstalled versions of software may not be identical to retail versions. Simulated user interface screen shown. Screen image simulated.

Copyrighted material

Head2Head

A showdown among natural PC competitors

THIS MONTH: Tablet PC: Slate vs. Convertible

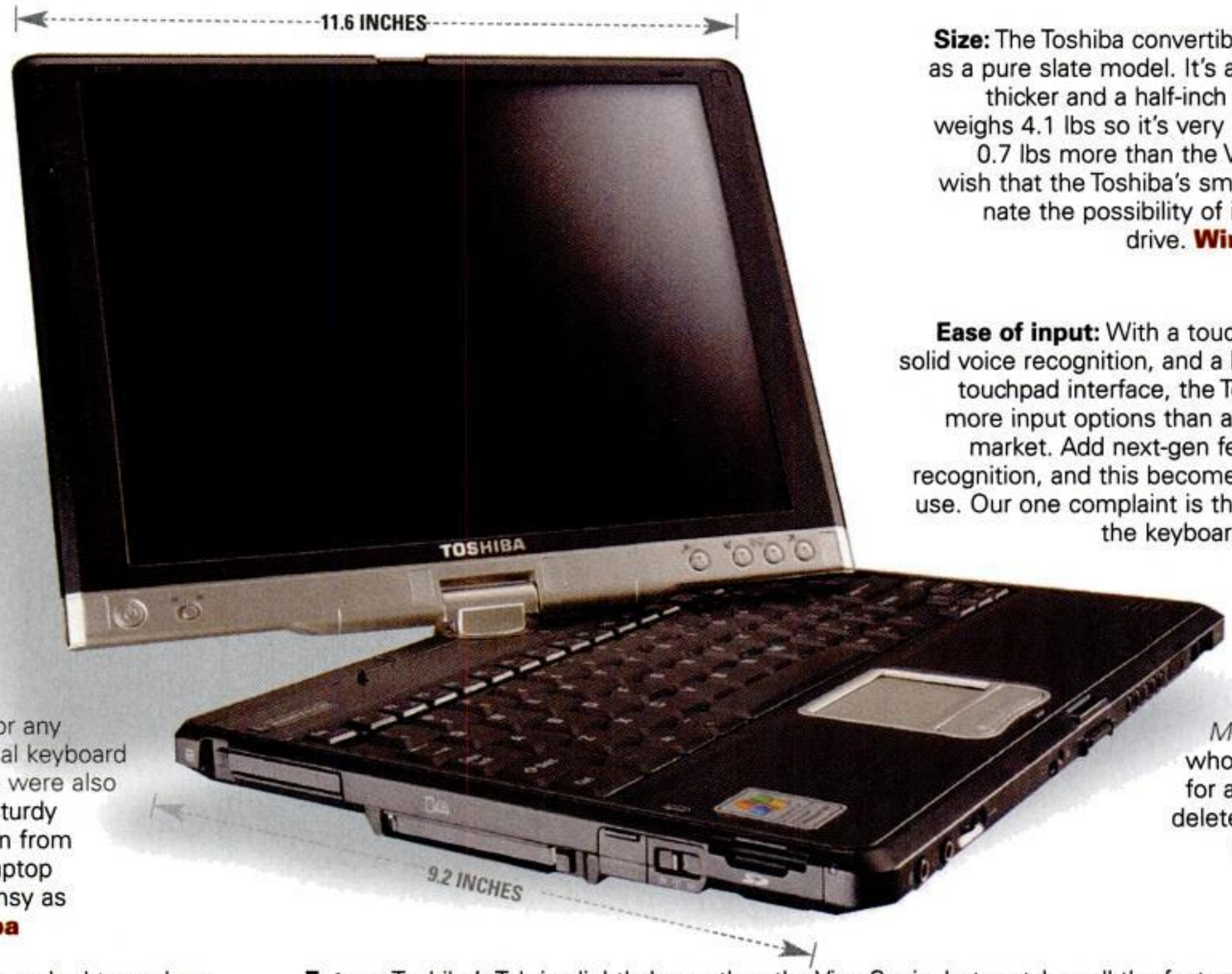
Picture a PC without a keyboard and mouse. You navigate across the screen with the swipe of a pen, and even use your voice to control the computer. You can also draw diagrams and enter longhand directly into a Tablet PC, then e-mail your notes at will. All devices that fall under the Tablet PC spec include the Tablet Edition of Windows XP and a screen you can write on. Beyond that, there are two different Tablet PC variants: "slates" and "convertibles."

Slates are the purest form of Tablet PC. With no integrated keyboard or mouse, the only way to interact with a slate device is with a stylus. Convertibles, meanwhile, are similar to standard notebooks—they include a tablet screen, but also a keyboard and pointing device. The screen can be raised and lowered, just like the display of a normal notebook, but it can also be turned 180 degrees (so that it faces outward) and then shut closed to resemble a slate-style Tablet PC.

Our big question wasn't whether we like Tablet PCs (we do), but which formfactor we prefer, slate or convertible? In this Head2Head, we compare a Toshiba convertible to a ViewSonic slate. For more info about Tablet PCs, please see our technology preview in the January 2003 issue. It should answer any questions not addressed here.

—WILL SMITH

TOSHIBA PORTEGE 3500



Basic specs: The Portege sports a 12-inch screen with a max res of 1024x768. Key hardware components include a 1.33GHz Mobile Pentium III, 512MB of PC133 SDRAM, and a 40GB 5400RPM hard drive. Unfortunately, the Portege lacks any kind of optical drive, though an external USB DVD-ROM is an option. Optical drive or not, the Portege easily spanks the ViewSonic in our raw specs showdown. **Winner: Toshiba**

Size: The Toshiba convertible isn't as compact as a pure slate model. It's about a quarter-inch thicker and a half-inch longer. The Toshiba weighs 4.1 lbs so it's very light, but that's still 0.7 lbs more than the ViewSonic. Still, we wish that the Toshiba's small size didn't eliminate the possibility of including an optical drive. **Winner: ViewSonic**

Overall usability: Hear this now and commit it to memory: Convertibles like the Portege reign supreme over slates. While a pen-based interface is great for taking notes during meetings and phone conversations, it's a little too unwieldy for any extended writing, so a traditional keyboard and cursor control are vital. We were also impressed with the Portege's sturdy hinge, which swivels the screen from Tablet PC mode to traditional laptop mode. It's nowhere near as flimsy as we expected. **Winner: Toshiba**

Ease of input: With a touch-sensitive screen, solid voice recognition, and a basic keyboard and touchpad interface, the Toshiba Portege has more input options than any other PC on the market. Add next-gen features like gesture recognition, and this becomes a PC anyone can use. Our one complaint is that the small size of the keyboard precludes a dedicated Delete key. For anal-retents who never make mistakes, this isn't a problem, but for *Maximum PC* editors who still hunt and peck for a living, a dedicated delete key is mandatory. **Winner: Toshiba**

Battery life: To test battery life, we had to eschew our usual DVD playback test because neither of the Tablet PCs is equipped with an optical drive. So we set an eight-minute MP3 to loop indefinitely and timed how long the device ran with its screen and backlight powered on. We were a little surprised by the Toshiba's puny 1:52 (hours:minutes) of run time. However, 1:52 isn't much worse than the ViewSonic's battery life, which clocked in at 2:20. Neither Tablet PC has enough battery to last through a marathon Monday morning assignment meeting, but the Toshiba is the clear loser here. **Winner: ViewSonic**

Extras: Toshiba's Tab is slightly larger than the ViewSonic, but matches all the features offered by the ViewSonic, and adds a bit more. We especially dig the Compact Flash and SD card slots, which make it as easy as possible to grab photos from a digital camera. The only thing this Tablet PC lacks is a FireWire port. Toshiba also took special care to make pen-based navigation easy. In addition to the standard interface, the Portege includes "gesture-recognition" shortcuts. For example, you can click a button on the pen, make a J shape on the screen, and Windows *Journal* opens. An upward slash copies text to the clipboard, and a straight line drawn from right to left is like clicking the Back button in your browser. In our opinion, advanced gesture recognition should be directly built into Windows XP Tablet Edition. **Winner: Toshiba**

MAXIMUM PC VERDICT

Portege 3500
TOSHIBA

www.toshiba.com
$2,500

8

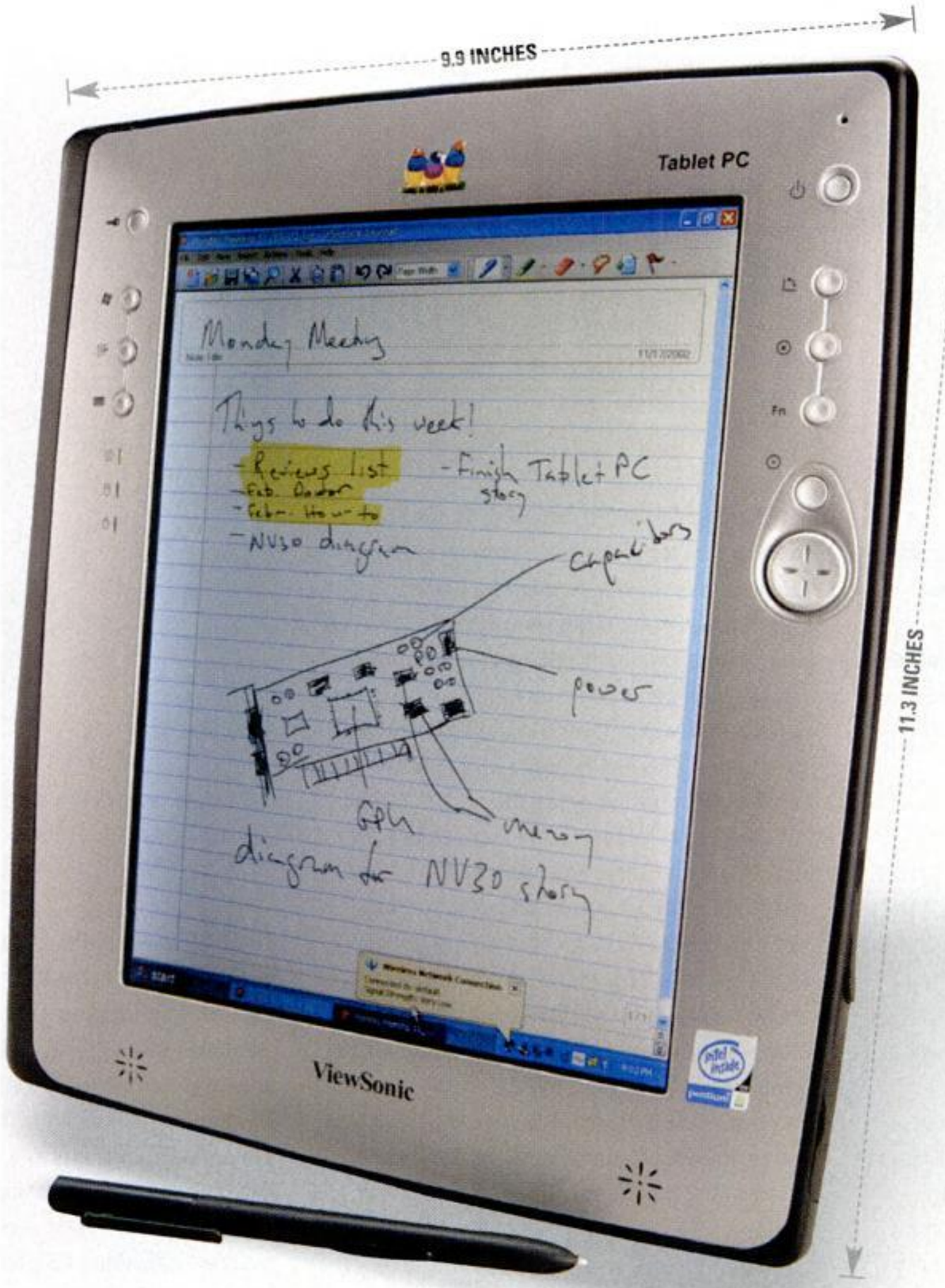
Copyrighted material

VIEWSONIC TABLET PC V1100

Basic specs: At 10 inches diagonal, the ViewSonic's screen is smaller than Toshiba's, but it's still ample space for the 1024x768 native resolution of the panel. The ViewSonic is definitely not a speed queen, though. Its processor is a puny 866MHz Pentium III Mobile, and it's married to just 256MB of SDRAM. The ViewSonic only includes a 20GB, 5400rpm hard drive, so don't expect to store a large music collection or any appropriated DVDs on this puppy. **Winner: Toshiba**

Overall usability: When we first saw it, the ViewSonic's pure slate design got our geek juices flowing. The V1100 was, after all, the first Tablet PC we ever played with. But after several hours of use, our giddiness subsided. We can't really see using a pure slate as anything more than a hyper-expensive notepad. Pen input is just too inconvenient for complex tasks, and the whole design feels kind of half-baked when you begin to consider the versatility of a convertible. **Winner: Toshiba**

Battery life: In order to fully replace a trusty pen-and-paper combo, we think a Tablet PC needs to run for four-plus hours on batteries. Unfortunately, the only way to do that with today's Tablets is to turn the backlight all the way down and turn off all nonessential services, such as Wi-Fi. At a reasonable backlight setting with some basic hardware enabled, the ViewSonic was able to bust out 2:20 minutes of run time, besting the Toshiba by about a half-hour. **Winner: ViewSonic**



Size: Finally, we've found something that the ViewSonic tablet clearly excels at: daintiness. Almost a full pound lighter and a quarter-inch thinner than the Toshiba, the ViewSonic is about as small as a PC can be and still be a PC. Of course, the ViewSonic's screen is two inches smaller than the Toshiba's, but that doesn't translate into a whole lot of lost real estate. **Winner: ViewSonic**

Ease of input: Let's face it: Pure slates are cool looking. Small and sexy, what's not to like? But when it comes time to sit down and get some work done, they're a royal pain in the arse. Even after we modified the way we entered the letters B, P, and D, the Tablet handwriting recognition software was slower and much less accurate than using a keyboard. One handy feature offered by the ViewSonic but not the Toshiba is a console-like D-pad that can be used to scroll through web pages and documents. Unfortunately, the orientation of the D-pad scroll movements doesn't change when you change the orientation of the screen. Oopsie. **Winner: Toshiba**

Extras: The ViewSonic slate includes many of the same Tablet PC basics as the Toshiba: Compact Flash memory slots, a PCMCIA slot, USB, integrated Ethernet, and 802.11b wireless LAN access. Although it lacks an SD memory slot, it adds a FireWire port, which is more than a fair trade in our book. Unfortunately, the ViewSonic doesn't include gesture recognition, and this is a major strike. Although the ViewSonic includes integrated Wi-Fi, we were horrified by its poor reception beyond 15 feet from an access point. We went so far as to plug an add-in Wi-Fi card into the Tablet's PCMCIA slot to see if the V1100 just had a bad aura, but our Orinoco card worked fine. **Winner: Toshiba**

MAXIMUMPC VERDICT

V1100
VIEWSONIC

www.viewsonic.com
$2,000
6

THE UPSHOT

The Tablet PC is a grand idea, but it still suffers from "first-generationism." The spec itself needs to include more pen-friendly interface tools, such as gesture recognition, and the handwriting recognition needs to be much more flexible. Ideally, a Tablet PC should learn how a user makes troublesome characters, then modify itself to recognize those letters and numbers.

At this point, we can't recommend the slate formfactor to anyone who wants to use his or her Tablet PC as more than an electronic notepad. We sincerely hope that the next rev of Windows XP Tablet Edition will fill in some of the gaps in the current build. On the other hand, we'd now give pause before buying any new non-gaming notebook that wasn't a convertible Tablet PC. The electronic notepad is ever so useful. A student today could conceivably carry a Tablet PC to class and use it not only for taking notes, but also for carrying any number of textbooks in electronic form. Awesome! (Or not, depending on how much you like school.)

Copyrighted material

WatchDog

Say hello to **Mad Max,** Watchdog of the Month.

Maximum PC takes a bite out of bad gear

THIS MONTH: The WatchDog goes after...

> Dogs > VisionTek > Fujitsu > Hewlett-Packard

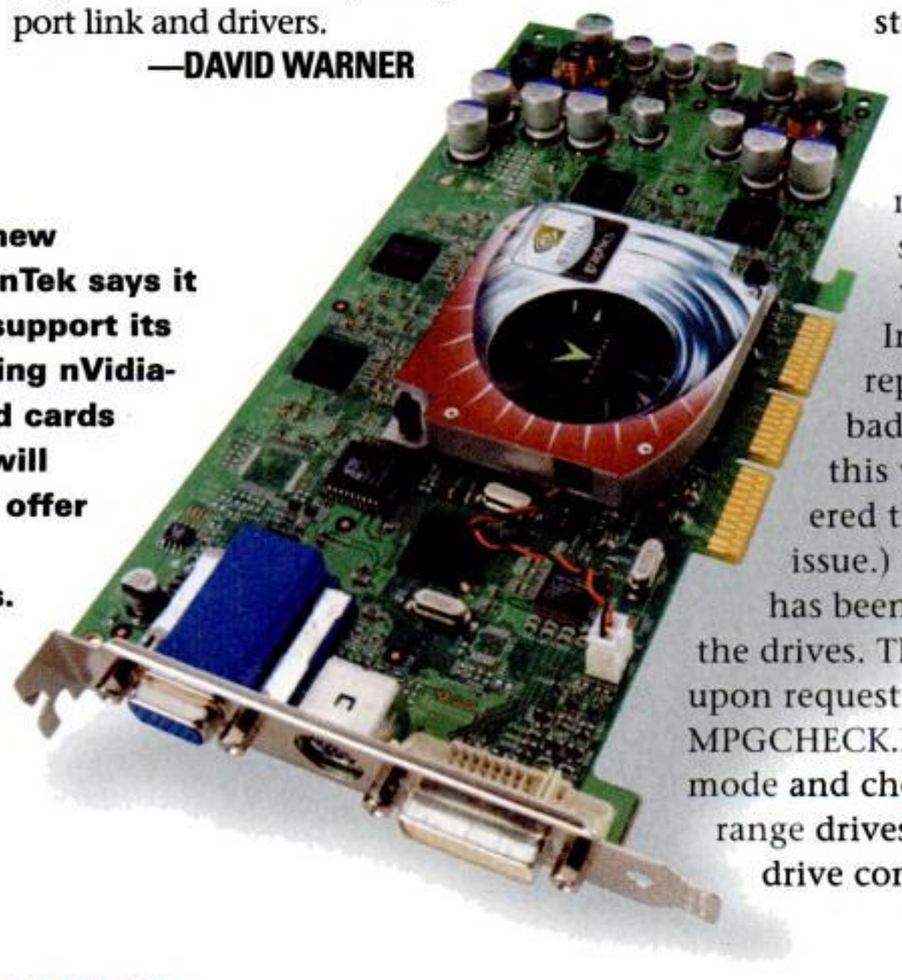
Dog Seeks Dogs

Is your dog mean enough to be a Watchdog? The Dog is searching for 12 canines to appear as mascots for the monthly Watchdog column. Send your submissions to watchdogcontest@maximumpc.com.

VisionTek Lives, Switches to ATI

DEAR DOG: A month before you warned us of VisionTek's uncertain future, I had sent an Xtasy Everything 5564 AGP card in for repair or replacement. After a month, I called a VisionTek support tech whose direct number I had obtained in the past. He informed me "not to worry;" and although he wasn't sure of the company's future either, he assured me that "all current warranties and RMAs will be honored," and that my card was waiting to be shipped back to me any day. It has been a while since I was told that my card was waiting to be shipped, and I still haven't seen it. None of my e-mails are being answered by VisionTek's new and rather limited web page that contains only a support link and drivers.

—DAVID WARNER



The new VisionTek says it will support its existing nVidia-based cards and will soon offer ATI cards.

THE DOG RESPONDS: Although things were looking dire for VisionTek customers, the situation has taken a turn for the better. Hartford Computer Group purchased VisionTek and plans to continue selling products under the original name. Michael Innes, director of sales and marketing with VisionTek, said the new company plans to honor all previous warranties on VisionTek products.

"We want to pass on the message first and foremost that we're alive and we have support for all our products out there, and we have new offerings coming out soon," Innes told the Dog. VisionTek will also switch from using nVidia graphics chips in its boards to using ATI chips, but the company has an inventory of nVidia parts to honor any warranties on its older boards. With this news, the Dog feels safe lifting the ban on purchasing any VisionTek products. Woof.

Fujitsu Hard Drive Failures

DEAR DOG: We got a chuckle when we read your January column about the lawsuit against Fujitsu and its faulty MPG drives. We run a small repair storefront in Florida called Southern Software Systems. We've probably had more than 100 drives sent back to Fujitsu within the last year. Initially some of the replacements were also bad. (I can only assume that this was before they discovered the Cirrus Logic chip issue.) Otherwise, the company has been excellent in replacing the drives. There is an available tool upon request from Fujitsu called MPGCHECK.EXE. It runs in DOS mode and checks for suspect-date-range drives. I run it on all Fujitsu drive computers that come through my door and have prevented many possible headaches.

—JUSTIN MIRAVALLE

Hewlett-Packard will settle a class-action lawsuit by upgrading some DVD+RW 100i drives to 200i drives.

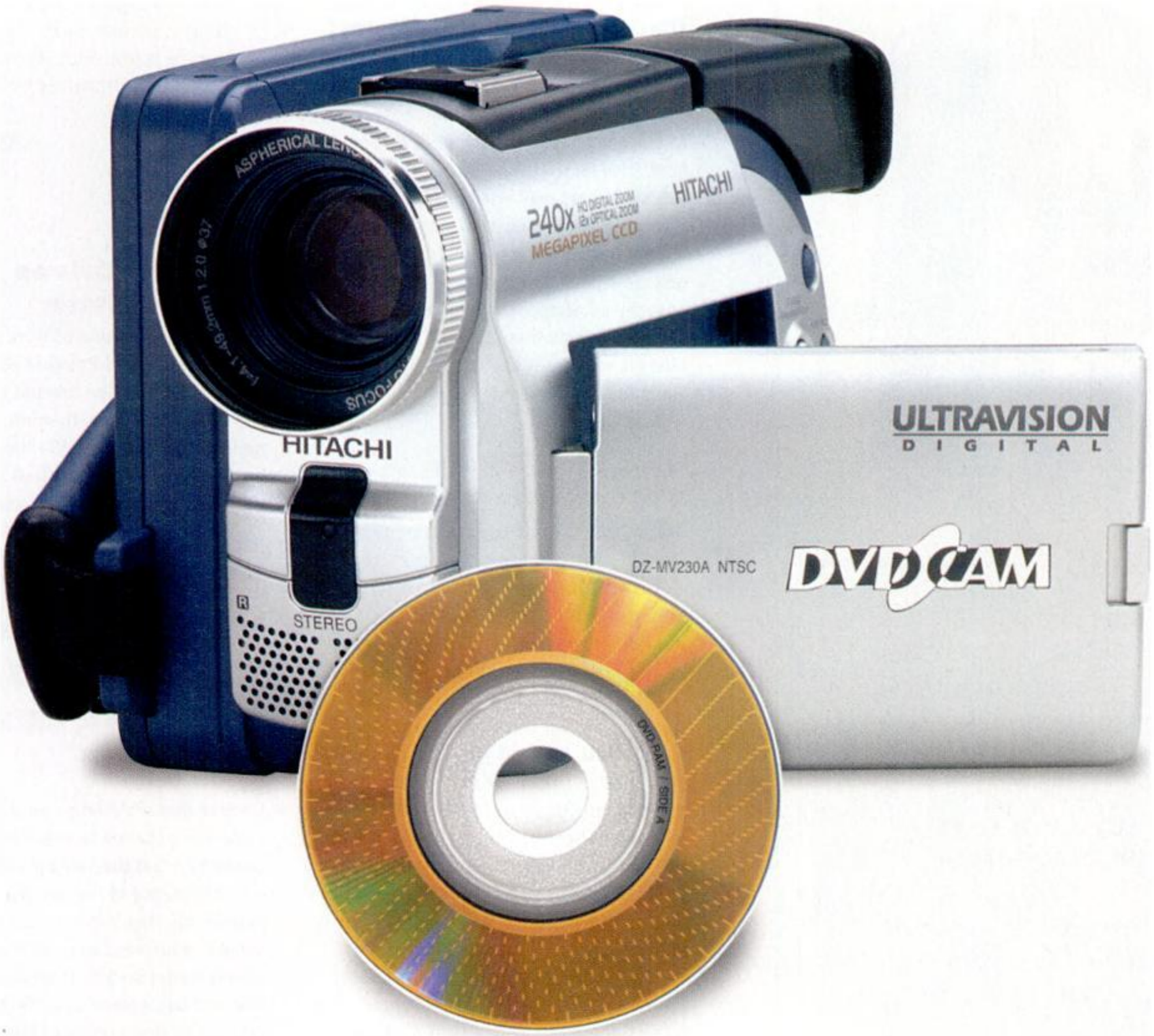
THE DOG RESPONDS: Unfortunately, Fujitsu doesn't seem to make this utility available, but Hewlett-Packard has a similar utility to test its machines that shipped with the drive. HP has actually been advising customers who have PCs equipped with the Fujitsu drive to test their system with the utility and to replace the drive if it tests positive. The company says the Fujitsu hard drives were used in only a number of machines: Deskpro (EN, EX, EXS) desktops, iPaq desktops, Deskpro workstations (AP240, AP250, AP550), and Evo (D300 and D500) desktops sold between fall 2001 and fall 2002. The faulty drives were not used in any Compaq EVO D510, D310, or Presario desktop PCs.

"We want to pass on the message first and foremost that we're alive and we have support for all of our products out there and we have new offerings coming out soon."

Hewlett-Packard said that although Fujitsu initially said the problem was limited to drives manufactured between October 2000 and March 2001, Fujitsu has since extended the period to include drives made between June 2000 and October 2001. Hewlett-Packard said the problem apparently stems from the use of inorganic phosphorus in the resin during the manufacture of one of the chips on the drives. The problem seems to primarily affect 10MB, 15MB,

Copyrighted material

Unapologetically advanced.



Hitachi introduces the world's first multi-format DVD camcorder. It's so advanced, it literally changes the way home movies are made. The UltraVision Digital DVD Camcorder records onto DVD-R or DVD-RAM, plays back on most computer DVD drives and most standard DVD players, and shoots digital still photos, too. Edit on your computer and make copies of discs for friends with optional editing software. Or edit in the camcorder with the easy disc navigation system. It's a whole new way to make home movies. And view them. See for yourself at your nearest Hitachi dealer.

UltraVision. The one to watch.

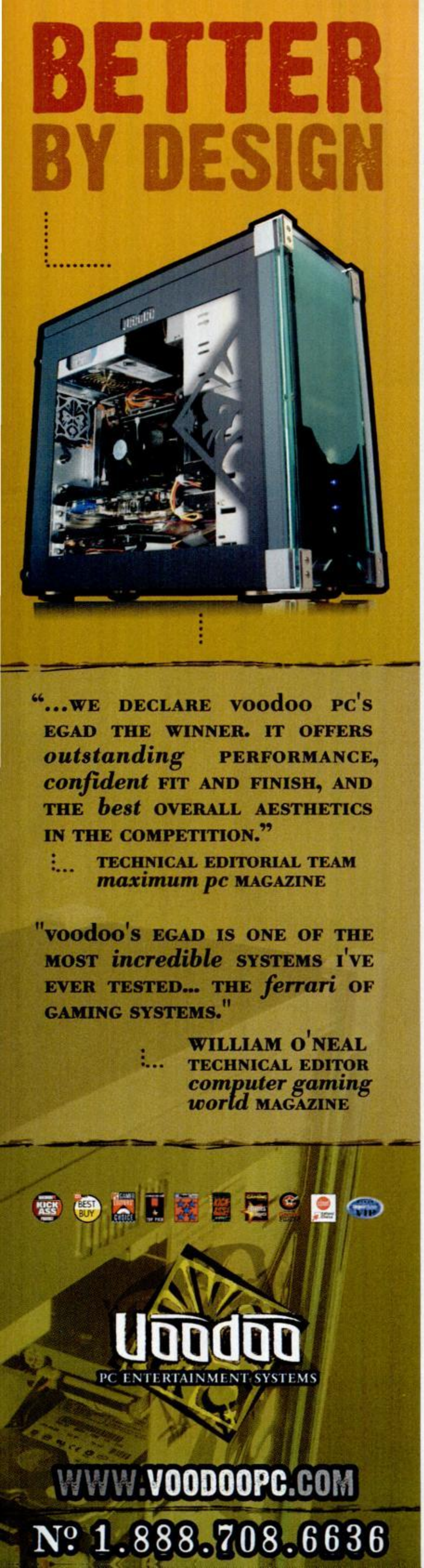
www.hitachi.com/tv

ULTRAVISION DIGITAL

© 2002 Hitachi, Ltd. UltraVision Digital is a registered trademark of Hitachi Home Electronics (America), Inc.

HITACHI
Inspire the Next

Copyrighted material


BETTER
BY DESIGN
"...WE DECLARE voodoo PC's EGAD THE WINNER. IT OFFERS outstanding PERFORMANCE, confident FIT AND FINISH, AND THE best OVERALL AESTHETICS IN THE COMPETITION."
... TECHNICAL EDITORIAL TEAM maximum pc MAGAZINE
"voodoo's EGAD IS ONE OF THE MOST incredible SYSTEMS I'VE EVER TESTED... THE ferrari OF GAMING SYSTEMS."
... WILLIAM O'NEAL TECHNICAL EDITOR computer gaming world MAGAZINE
KICK ASS
BEST BUY
VIP
voodoo
PC ENTERTAINMENT SYSTEMS
WWW.VOODOOPC.COM
№ 1.888.708.6636

Consumer Advocate

20MB, and 40MB Fujitsu drives (at both 5,400 and 7,200 spindle speeds) that run in 24/7 conditions with power saving disabled. Hewlett-Packard said the symptoms of a bad drive are "drive not ready" errors at POST, 1720 Intellisafe or 1782 errors during POST, hanging, or spinning down during use. Hewlett-Packard is encouraging customers to check their hard drives with the test utility. The company is offering a 60GB upgrade hard drive for free or an 80GB hard drive for $35. Customers may also return the system to Hewlett-Packard and have another 40GB drive installed. For more information on the replacement and to download the utility visit: www.hp.com/support/hdreplacement. For more information about the Fujitsu lawsuit, visit www.sheller.com/fujitsuclassaction.htm.

Give the Military a Frickin' Bone

DEAR DOG: I'm writing you because of the frustratingly poor support that web sites provide for the military men and women of our country who are located overseas. And the worst part is, the situation could be fixed so easily. All the online stores would have to do is add six letters to their order forms: AA, AE, and AP. These are the state codes (just like MI for Michigan, etc.) for military members overseas. Without those six letters we are totally unable to order from a vendor's web site.

Shopping on the base is like relying on Target to meet your every need. When it comes to computer gear, it's very difficult buying off the base because the manual and software often aren't in English. Online stores are the perfect solution. I can't even begin to express my delight with Amazon.com. Sites like this make living away from home a lot easier than it ever was in the past. Unfortunately, many online sites do not support the APO/FPO addresses on their ordering forms.

Sending something to military personnel is like sending it to New York or Los Angeles. That's where our postal centers (the aforementioned APO and FPO) are located. The military foots the bill for overseas shipping of our mail. None of the major companies or web sites has a problem with this, so I can only guess (or at least hope) that the smaller companies are simply uninformed. I've tried a number of times to contact web sites and let them know what's happening, but I never get a satisfying response. Either the customer service people don't understand or don't care. I don't know which it is, but I don't believe in complaining without trying to fix the situation.

Please, please, Dog, throw the military a bone here. Help us get this info out to companies by publishing my complaint!

—JEREMY BROIN

THE DOG ABIDES.

DVD+RW Drives Get Rewritten

Reader Gregory West of Wisconsin sends word that Hewlett-Packard has agreed to settle a class-action lawsuit over its first-gen DVD+RW drives. Hewlett-Packard originally billed its first DVD+RW DVD100i as being upgradeable to DVD+R standards via firmware. Months later, the company learned that the drives couldn't be updated without a physical tweak. Consumers then squawked that they only purchased the drives because of the promised upgrade, at which time Hewlett-Packard offered to let some consumers swap out the drives for a newer model for $99. Now Hewlett-Packard has agreed to settle the lawsuit brought by Brian Delre of New Jersey.

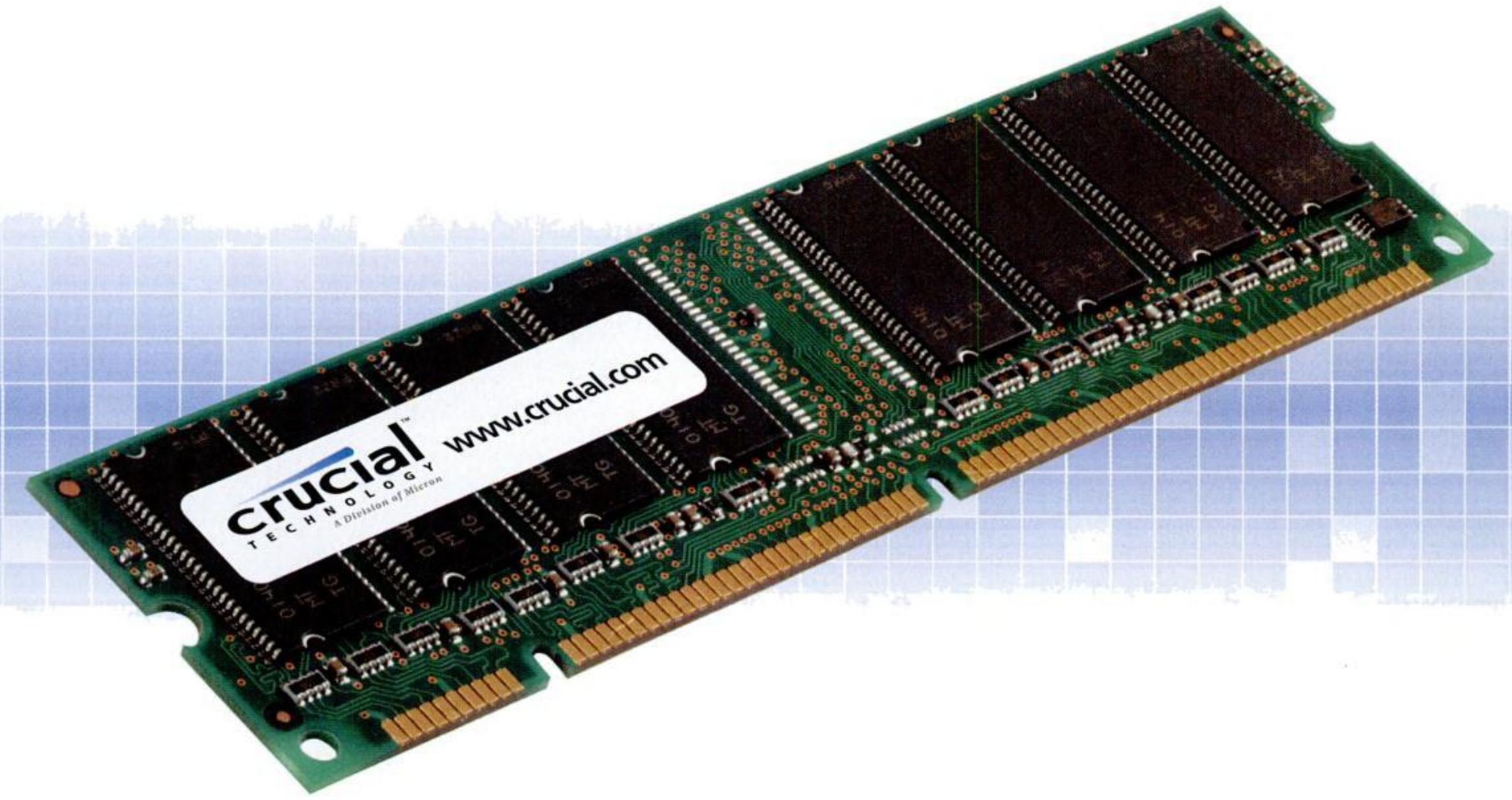
"Some consumers then squawked that they only purchased the drives because of the promised upgrade."

Under terms of the settlement, Hewlett Packard has agreed to replace all HP 100i drives purchased before May 1, 2002 with HP 200i drives. Consumers must provide credit card information and send the old drives back to Hewlett-Packard. For those people who participated in Hewlett-Packard's original exchange, the company has agreed to refund their $99. The settlement applies to folks who purchased stand-alone drives and those people who received the 100i drives in certain Hewlett-Packard Pavilion PCs: P6399A (780N); P6398A (790N); P6326A (980C); P6327A (990C); P7537A (370N); P7479A (781N); and P7487A (781C).

For more details on the settlement visit: www.hp.com/support/dvd100i_class_settlement. The New Jersey suit has no bearing on a separate HP-related class-action lawsuit winding its way through the California courts. ■

Copyrighted material

The world's leading computer companies buy memory from us.



Shouldn't you?

When you buy a memory upgrade from Crucial you're buying directly from Micron—one of the world's largest DRAM manufacturers and a major supplier to the global computing industry. Buying directly from the manufacturer gives you access to the highest quality products at the lowest possible prices, backed up by expert technical support and world-class customer service, and topped off with guaranteed compatibility and a limited lifetime warranty. It's that simple.

Order today and we'll ship it free!*

256MB PC133 SDRAM

$41.39

for today's most popular systems

FREE SHIPPING*

PC Makers' CHOICE — Over 15,000 Systems

Shoppers' Computer Shopper Choice 2001

Circle of Excellence — BizRate.com

Order online:

www.crucial.com

or call toll-free 1-888-363-5154

crucial™ TECHNOLOGY
A Division of Micron

The Memory Experts℠

*See Web site for details.

Price reflects an automatic 10% discount for ordering online. Prices may vary according to specific system requirements. The price listed was valid on 1/10/03 when we sent this ad to the publisher; however, prices may have dramatically increased or decreased since then. Visit the FAQ section of Crucial.com/uk to learn more about why memory prices go up and down.

© 2002 Micron Technology, Inc. All rights reserved. Micron Technology, Inc., is an authorized licensee of the CompactFlash™ and MultiMediaCard™ trademarks. The Memory Experts is a service mark and Crucial Technology, the Crucial logo and Micron are registered trademarks of Micron Technology, Inc. All other brands and names used herein are the property of their respective owners. Crucial Technology is a division of Micron Semiconductor Products, Inc., which is a wholly owned subsidiary of Micron Technology, Inc. Phone 208-363-5500. Fax 208-363-5501. E-mail crucial.sales@micron.com. Crucial Technology is not responsible for omissions or errors in typography or photography.

Copyrighted material

SPEED

We benchmark a lab full of hardware to answer your most burning performance questions. Only the fastest PC technologies will take the checkered flag!

Let's start with the operative word: "maximum." The magazine isn't called *Relatively Fast PC,* and it's definitely not called *Minimum PC.* Month in, month out, we celebrate the absolute fastest PC technologies, to the point of silliness, some would argue, considering the sometimes vast differential between the power provided by cutting-edge hardware and the power required by cutting-edge software.

Does everyone "need" the fastest performance allowed by natural law? No. That's why next month's cover story will be devoted to budget upgrading. The world's best second-tier parts still have much to offer the cost-conscious hardware hacker. You just have to choose wisely.

But this month we go straight for the jugular with enough Lab testing to please even the most voracious data-acquisition freaks. Our essential question was simple: "Which is faster—technology A or technology B?" We trust that our benchmark results will provide answers that directly relate to your upgrading considerations. Oftentimes, throwing out old parts for new makes perfect sense. And sometimes it does not.

During benchmarking, we did our best to respect the scientific method and isolate specific PC subsystems in each speed trial. Nevertheless, when it came to judging CPUs, we threw caution to the wind, and allowed each processor company to roll up to the starting line with its fastest available platform specs. We weren't interested in bang-for-the-buck or CPU architecture efficiency. We only wanted to know who was capable of sending the highest-performing hot rod to the track, CPU and bus speed inequities be damned.

Regrettably, we weren't able to score a final GeForce FX board for an nVidia vs. ATI showdown. If we can't provide definitive benchmarks in next month's issue, we'll either shut down the Lab and convert it into a microbrewery, or launch a letter-writing campaign demanding the NV30's immediate release from the nVidia compound.

Elizabeth is just about to raise the green flag, so let us begin...

Copyrighted material

SPEED TRIALS

This month's Speed Trials are being conducted under the stewardship of Elizabeth. Is she into PCs? Yes. When she began describing what she thought of the leaked *Doom III* demo, our jaws dropped. Does she care about cars? Yes—she even goes to NASCAR races!

SPEED TRIALS

Who makes the fastest dual-CPU platform—Intel, AMD, or Apple?

The Mac dual-G4 looks like it came off the set of *Minority Report*, but it's nowhere near as fast as a Maglev car.

THE TEST: First off, you might be wondering why we didn't run a single-proc showdown. The answer is simple: The fastest Macs run two CPUs, and we wanted to give our apple-cheeked brethren the best opportunity to strut their wares. Nonetheless, comparing dual-CPU rigs was an imposing task. The fastest SMP-capable procs from Intel, AMD, and Apple all run at different clock speeds and use different memory buses. And then you have to consider software issues: Which benchmarks are common to both PCs and Macs? In the end, we allowed each computer platform to enter the fray with its fastest available CPU frequencies and support hardware. Remember, as with previous CPU tests we've conducted, the question at stake wasn't, "Who makes the fastest core CPU architecture?," but rather, "Who makes the fastest CPU platform?" If you want to stir up the old "megahertz myth" debate, we're not biting. *We fully concede that two different core architectures clocked at identical frequencies will rarely perform identically.*

For the showdown, Apple submitted what it considers to be its best dual-CPU machine: two 1.25GHz Motorola PowerPC G4 chips teamed with the OSX 10.2 operating system (which uses a Unix kernel). Each processor features 256K of full-speed, on-die L2 cache, and 2MB of mobo-bound L3 cache. Sadly, the G4 system bus runs at just 167MHz. Our Apple test machine came with 2GB of DDR333 memory, and an Apple-only version of the GeForce4 Ti videocard. Strangely, while Apple did send us its fastest videocard, the company couldn't tell us if the Geforce4 Ti ran at 4200 speeds, 4600 speeds, or something in between. Regardless, an IBM 120GXP (2MB cache) pulled storage duties for the Apple rig.

For our PC contenders, we built two machines ourselves. For the AMD rig, we stuffed two new Athlon MP 2400+ processors (2GHz a piece) into a Tyan Tiger MPX motherboard, which uses AMD's 760MPX chipset. We used 2GB of Corsair DDR333 RAM clocked at 266MHz (the speed of the system bus for AMD's dual-proc "MP" platform). The AMD rig was completed with an nVidia GeForce4 Ti 4600, a Western Digital WD1200JB drive, and Windows XP Pro with Service Pack 1. The Western Digital hard drive features an 8MB cache, but it's of the same generation as Apple's IBM 120GXP drive.

For the Intel machine, we used Iwill's hot new DPL533 motherboard and two 2.8GHz Xeons processors with Hyper-Threading enabled. Each CPU comes with 512K of L2 cache, so for all intents and purposes, these procs are just regular P4s stamped with the Xeon name. The motherboard's E7505 chipset supports dual-channel DDR266, so we were able to use the exact same 2GB of memory that we stuffed into the AMD rig. We should also note that Intel isn't going with RDRAM for its dual-proc platform, but the Xeon bus is clocked at 533MHz. The Xeon rig's videocard, hard drive, and OS were identical to those of the AMD rig.

And, finally, the benchmarks: We started with *Quake3* because of its uncanny ability to yield higher and higher scores as CPUs, system buses, and videocards scale faster and faster. We ran the game demo (patched to version 1.32) in two different modes. At the "normal" low-res mode of 640x480, the benchmark is effectively a memory bandwidth test. In our 1024x768 high-res mode, it becomes more of a CPU test. We also ran *Jedi Outcast* at the same resolutions as *Quake3*; this test leans heavily on the CPU. Our original *Jedi Outcast* benchmark doesn't run on dual-proc machines, so we patched the game to version 1.04 and re-recorded another demo just for this article.

We normally use Adobe *Premiere 6.01* to render and export a mini-movie to MPEG2. Since *Premiere 6.01* doesn't natively support Apple's OSX, we decided to update the software to *Premiere 6.5* and export the movie to *QuickTime* instead. For Adobe *Photoshop 7.0*, we used the standard Maximum PC action script, which throws about a dozen filters and actions on a 9MB file. Finally, Newtek's *LightWave 7.5* is a popular pro-level 3D application. Of all of the applications here, it's the only one that's truly workstation-class. For this test, we simply recorded how long it took the machines to render a single frame using the standard raytrace *LightWave* benchmark file that's included with the software. Like many new apps, *LightWave* takes advantage of the SSE2 instructions in the Pentium 4, and also offers some optimizations specifically for the Mac. This test is a major CPU hog, and is heavily multi-threaded.

THE RESULTS: We came to one conclusion very quickly after reviewing the numbers: Mac people who scream that their Apples are faster than PCs are simply so full of crap, they could double as septic tanks.

Our tests also reminded us that investing in a dual-CPU platform may not make much sense just yet. Although *Premiere 6.5* and *Photoshop 7.0* are multi-proc-aware, the actual programs (as well as their filters and functions) barely ever touch both CPUs. The two apps, while popular, have fairly old cores that just don't exercise dual processors with much frequency. For this reason, Intel is facing an uphill battle with its Hyper-Threading technology. Hyper-Threading, which turns a single CPU into two virtual CPUs, can't really help programs that don't know how to use it.

The dual-G4's saddest showing was in the gaming battle. The dual-Athlon was between 30 percent and 73 percent faster than the Mac, while the dual-Xeon ran between 108 percent and 148 percent faster than the Mac. The Xeons also burned some holes in the Athlon MPs by running between 40 percent and 73 percent faster than the AMD chips.

It's not all about the megahertz, how-

Copyrighted material

Will memory with a lower CAS latency really make my PC run faster?

THE TEST: CAS stands for "column address strobe," and CAS timing is the measurement of a memory stick's latency when first accessing a string of data. CAS2 memory has less latency than CAS3 memory, and is thus potentially faster. By setting a faster CAS timing, you can get more headroom from your memory for overclocking. That's why many hardcore PC enthusiasts buy memory sticks spec'd for low CAS timings—they might ultimately run a CAS2.5 setting, but they still want the headroom to run CAS2.0 if an overclocking project demands it. That's all fine and good, but we wanted to know if lower CAS settings also provide a performance boost, all CPU and system bus speeds being equal.

Normally, CAS timing is automatically set by your motherboard based on the type of RAM you use. You can, however, force a more aggressive setting in some motherboard BIOSes. We set up an Asus P4S8x motherboard with a 2.8GHz Pentium 4, a 533MHz memory bus, and 512MB of Corsair PC2700 DDR memory rated for CAS settings as low as CAS2. The only other hardware installed on the system was a Radeon 9700 Pro. Our OS was WinXP Pro with Service Pack 1. We tested system performance with our memory set to three different timings: CAS1.5, CAS2, and CAS3. Our benchmarks were *SYSmark2002, 3DMark 2001SE* (default benchmark run), and *Quake3* demo001 (1024x768, 32-bit color).

THE RESULTS: Surprise, surprise: When we lowered our CAS setting in the BIOS from CAS3 to CAS2, we saw faster performance. However, the most significant speed boost we saw was in *SYSmark2002*—and it was just slightly more than 2 percent. Underwhelming, to say the least.

Does this mean you shouldn't shell out the extra cash for CAS2 or CAS2.5 RAM? Certainly not. One of the nice side effects of lower-latency memory is that it's more likely to cooperate with the nonstandard memory speeds sometimes necessitated

by overclocking. Bottom line: If you plan on overclocking your CPU by cranking up the memory bus, get memory that's able to muster lower CAS settings. As for setting memory rated for CAS2 to a much more aggressive CAS1.5, we found lower scores all around. We can only surmise that memory errors were to blame.

CAS Memory Settings

	3DMark 2001:SE	SYSmark2002	Quake3 Demo001
CAS1.5	13,057	246	254 fps
CAS2	**13,193**	**249**	**265 fps**
CAS3	13,072	244	262 fps

Best scores are bolded

ever. The gaming benchmarks highlighted a major problem with the Athlon MP platform these days: the chipset. The 760MPX chipset is ancient in the big scheme of PC progress. It only supports a 266MHz frontside bus and single-channel DDR throughput—quite slow compared with Intel's platform. The Athlon MP's point-to-point bus notwithstanding, the 760MPX is due for a major overhaul if it's to remain competitive. That said, the Athlon MP machine did do well in *Premiere* and *Photoshop*, and generally speaking, the AMD dual-proc platform has proven to either outperform or just barely lose to the Xeon platform in floating-point-heavy apps, as well as in programs that aren't coded to take advantage of the Xeon's SSE2 functionality.

As for the Xeon, its E7505 chipset is state-of-the-art. It boasts a 533MHz frontside bus (133MHz x 4), dual-channel DDR throughput, AGP 8x, and a 1GB/sec interconnect between chips. All this raw throughput and support makes the Apple and AMD chipsets look decrepit in comparison.

If you're really serious about building a dual-proc system, there's simply no question that Intel Xeons are the stars of the show—in this roundup, Intel took an overwhelming number of the tests. Truth be told, we thought the Apple machine and its loads of L3 cache would do much better. While AMD still provides the best bang for the buck, the Athlon MP platform needs a serious shot in the arm.

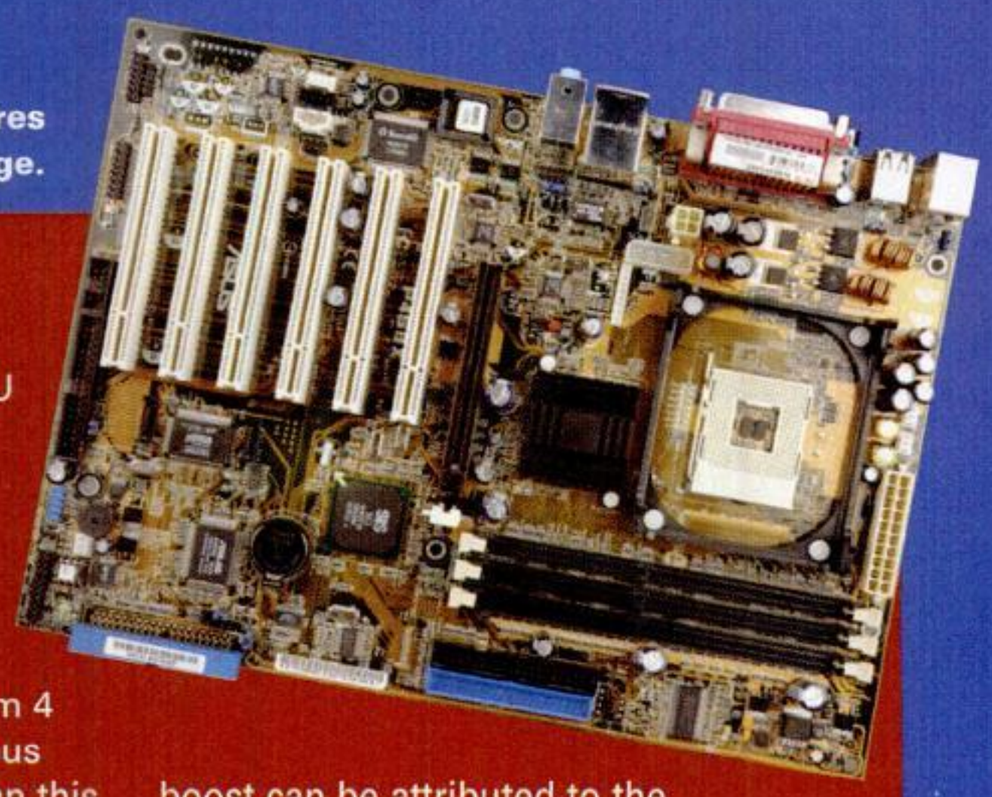
Dual-Proc Showdown

		Apple Macintosh	AMD PC	Intel PC
SPECS	CPUs	PowerPC G4s	AMD Athlon MPs	Intel Xeon P4s
	Clock speed	1.25GHz	2.0GHz	2.8GHz
	RAM speed	DDR266	DDR266	DDR266
	RAM amount	2GB	2GB	2GB
	Bus speed	167MHz	266MHz	533MHz
TESTS	Quake3 1.32 1024x768	135 fps	186 fps	**290 fps**
	Quake3 1.32 640x480	152 fps	193 fps	**327 fps**
	Jedi Outcast 1.04 1024x768	40 fps	69.8 fps	**101 fps**
	Jedi Outcast 1.04 640x480	41 fps	68.9 fps	**101 fps**
	Photoshop 7.0 MPC script	60 sec	35 sec	**34 sec**
	Premiere 6.5 export to QT	430 sec	335 sec	**328 sec**
	LightWave 7.5 RayTrace 8 threads	105.3 sec	88.3 sec	**55 sec**

Best scores are bolded

Copyrighted material

SPEED TRIALS



The Asus P4S8x mobo features the SiS648 northbridge.

All CPU speeds being equal, how much of a performance boost does the P4 receive when jumping from a 400MHz to 533MHz bus?

THE TEST: Initially, all Pentium 4 processors used a 400MHz system bus. But then Intel bumped up the bus speed to 533MHz with the May 2002 introduction of the 2.53GHz P4 core. The system bus carries data from the CPU to the motherboard chipset, which then distributes the data to other important buses, including the PCI bus and AGP bus. Supposedly, the 133MHz speed bump helps ameliorate the bottleneck that was forming when different components tried to access the P4 at the same time.

Intel touted its 133MHz jump, but we wanted to see just how profound an impact the bus speed increase has on real-world applications. Our Lab strategy started with nabbing an unlocked 2.8GHz P4 that's designed to run on a 533MHz bus. Because the CPU wasn't multiplier-locked, we were able to clock it down to 2.26GHz while still maintaining a 533MHz bus setting. We did so, and then ran *SYSmark2002*, *UT2003*, *Quake3*, and *3DMark 2001:SE*. Then we dropped a 2.2GHz Pentium 4 designed for the 400MHz system bus into the exact same system, and ran this CPU on its 400MHz stock bus speed. The test bed for both benchmarking rounds was based on an Asus P4S8x motherboard, 512MB of Corsair PC2700 DDR memory, and a Radeon 9700 Pro. The 533MHz test subject did have a 3 percent faster CPU clock speed, but we factored that difference into our analysis.

THE RESULTS: The bus speed increase yields benefits, but don't expect any miracles: We saw performance increases ranging from just 2 percent to 9 percent, depending on the benchmark. Some of the performance boost can be attributed to the 60MHz core frequency advantage of the processor running on the 533MHz bus. But in apps that need extra bandwidth—such as *UT2003* and *3DMark 2001:SE*—the 533MHz bus definitely showed its legs.

As 3D games become ever-more complex, there will be more need for bandwidth among the CPU, system memory, and AGP card. If you plan to play next-gen 3D games, an upgrade from 400MHz to 533MHz should definitely be on your to-do list. On the other hand, if you primarily run office apps, you're safe with a 600MHz Pentium III. Move along, grandma, nothing to see here.

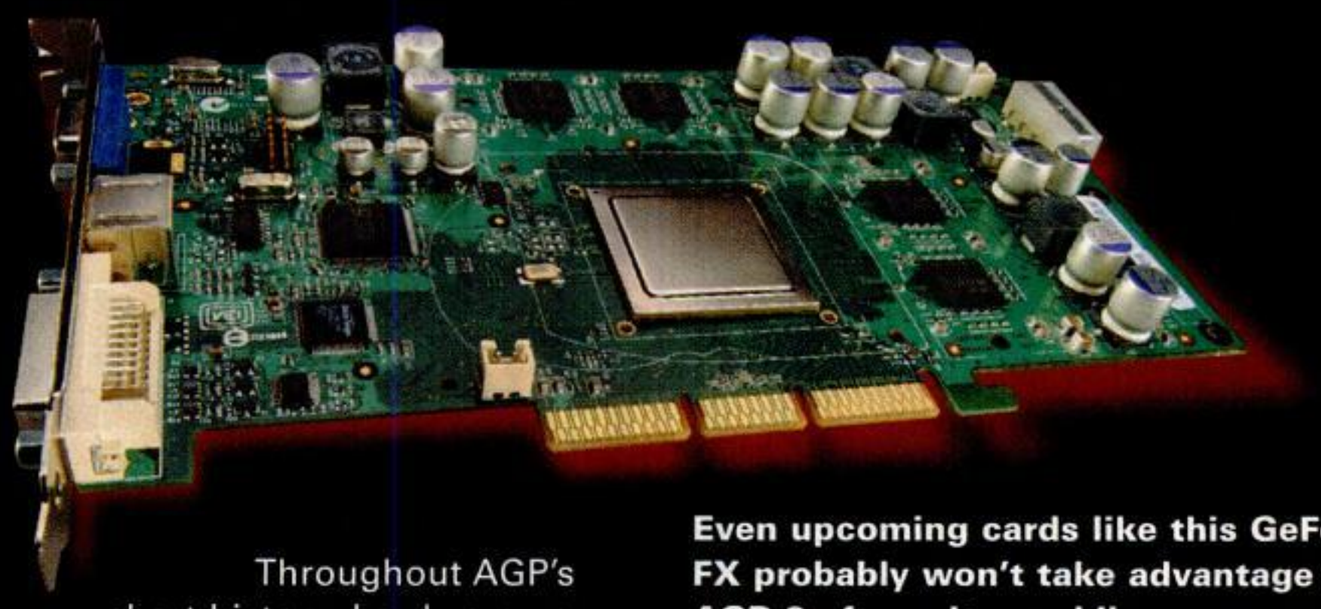
533MHz vs. 400MHz Bus

	3DMark 2001:SE	UT 2003 Demo	Quake3 Demo001	SYSmark2002
533MHz	**12,086**	**49 fps**	**229 fps**	**220**
400MHz	11,373	45 fps	225 fps	216

Best scores are bolded

Does anyone really need AGP 8x?

THE TEST: AGP stands for "accelerated graphics port," a data bus introduced by Intel in 1997 to replace the PCI bus for shuttling graphics data between the videocard and the CPU/memory subsystem. The AGP bus has gotten faster and faster since its inception, and in late 2002, motherboard and videocard manufacturers started offering support for AGP 8x, which, in theory, provides about 2.1GB/sec of bandwidth.



Even upcoming cards like this GeForce FX probably won't take advantage of AGP 8x for quite a while.

Throughout AGP's short history, hardware vendors have supported new bus speeds long before game developers even think of stressing existing AGP specs, so we wanted to know if the same holds true for AGP 8x. Would upgrading to an AGP 8x motherboard and 3D accelerator actually net tangible frame rate increases? We loaded up our trusty Asus P4S8x motherboard with an ATI Radeon 9700 Pro and 2.8GHz Pentium 4, and went to work

Copyrighted material

Does Serial ATA provide any performance boost to hard drives?

THE TEST: Quick recap: The new Serial ATA (SATA) hard drive interface uses cables that are much thinner and more manageable than traditional IDE cables, and doesn't require any jumper settings. But to speed freaks, the new interface's peak data throughput of 150MB/sec (up from an "unofficial" parallel ATA ceiling of 133MB/sec) might be the most attractive reason to invest in the technology.

Does SATA provide actual speed dividends, or is the new spec not yet necessary given the intrinsic internal limitations of today's hard drives? That's the question we intended to answer by comparing two identical 120GB Seagate Barracuda V hard drives—one armed with a parallel IDE interface, one armed with a SATA interface.

The drives were run in our standard test bed (2GHz P4, 512MB of PC800 RDRAM). We used the motherboard's onboard controller for the parallel IDE drive, and an add-in Silicon Image 3112 Serial ATA controller for the SATA drive. For our tests, we started with *HDTach* to record raw numbers on how fast a drive could read and write across its platters in a sequential manner, and how quickly its drive head repositioned itself during random data requests. From there, we turned to our own home-brewed *IOMeter* script to gauge random reading and writing speeds. We ended with the office application portion of the *SYSmark2002* suite to see how the two drive interfaces impacted real-world desktop performance.

THE RESULTS: In all our synthetic tests, parallel ATA outscored SATA—barely. In *HDTach's* read and write tests, it was only by a razor-thin margin of less than 1 percent. *HDTach* random access testing yielded a slightly larger difference in scores, and the parallel IDE drive widened the margin a bit further in *IOMeter*, pulling 129 I/Os per second to the SATA drive's 116. In the end, however, identical *SYSmark2002* scores confirmed that negligible differences in synthetic benchmarks don't necessarily affect real-world system performance.

So why did a new bus technology with a higher theoretical performance ceiling actually yield consistently lower (albeit negligible) performance in synthetic tests? Well, Seagate says our SATA results

should actually be a bit faster—courtesy of the SATA controller card's filter driver that aids caching. But we have to stick to our numbers. More or less, SATA and parallel ATA are in a dead heat. Who knows, maybe we just encountered a testing anomaly; the performance difference *was* small. And, as Seagate points out, the parallel ATA's ribbon design is running out of performance headroom, and SATA's real speed advantages will be obvious in upcoming 300MB/sec and 600MB/sec spec upgrades. Of course, internal drive speeds have to improve to meet the challenge.

Parallel vs. SATA

	Parallel	SATA
SYSmark2002 Office	161	161
HDTach average sequential read	**36.6 MB/s**	36.5 MB/s
HDTach average sequential write	**28.5 MB/s**	28.3 MB/s
HDTach random access time	**13ms**	13.4ms
IOMeter desktop total I/Os per second	**129**	116
IOMeter desktop average I/O response time	**496ms**	549ms

Best scores are bolded

(both the mobo and videocard support AGP 8x). We benchmarked the system with the AGP bus first set at 8x, and then 4x (it's a simple matter of changing BIOS settings). Our tests were *3DMark 2001:SE*, *Quake3* (Demo001 at 1024x768 with all settings maxed), and *Unreal Tournament 2003's* botmatch (1280x1024 with default settings).

THE RESULTS: In our tests, not only was the AGP 8x config no faster than the AGP 4x config, in some cases it was slower! Of course, the speed difference was less than 2 percent in all our benchmarks, which is well within the margin of error for each of the tests. Current 3D artwork—textures, character models, and environments—simply isn't complex enough to saturate the 4x bus. That said, we suspect that upcoming single-player games such as *Doom III* and maybe even *Unreal 2* may demand AGP 8x bandwidth.

Clearly, a 3D accelerator's core architecture, core speed, memory type, and memory speed have a much more profound impact on overall performance than does the videocard's bus technology. Sure, if you jimmied a Radeon 9700 Pro onto the PCI bus, and then played *UT2003*, your frame rates would slow to a crawl. But AGP 4x is still more than sufficient for today's code.

In short, AGP specs remain one generational step ahead of the world's fastest games.

AGP 8x vs. 4x

	3DMark 2001:SE	UT 2003 Demo	Quake3 Demo001
AGP 8x	13,193	55 fps	265 fps
AGP 4x	**13,216**	**56 fps**	265 fps

Best scores are bolded

Copyrighted material

Can IDE hard drives finally compete with SCSI drives?

THE TEST: Compared with IDE drives, SCSI hard drives are expensive and noisy, and generate far more heat. As a result, they don't make a lot of sense for consumer-level desktop machines. But in *Maximum PC* speed trials, we're only concerned with raw, unadulterated performance—how quickly a hard drive's platters can shoot off data to the rest of the system. Last month, IBM's Deskstar 180GXP set a new standard for IDE hard drives, and this month we were determined to see if the Deskstar could keep pace with the Seagate Cheetah 15.3K, the undisputed king of SCSI drives. Both drives boast an 8MB cache, but the IBM spins at 7200rpm while the Cheetah hits 15,000rpm.

To see if the fastest IDE drive we've ever tested could steal the Cheetah's thunder, we ran our standard series of hard drives tests (*SYSmark2002*, *HD Tach*, and *IOMeter*) in our standard test bed (an Intel D850MV mobo, 2GHz P4, and 512MB of PC800 RDRAM). The SCSI drive was teamed with an Adaptec SCSI 39160 controller.

THE RESULTS: In the straightforward *HDTach* sequential read test, the Cheetah's superior spindle speed destroyed the IDE drive by a margin of 30 percent (64.7MB/sec vs. 45.5MB/sec). Even more astounding was the Cheetah's edge in *HDTach's* random access test. When it came to repositioning its drive head, the Cheetah was, on average, about 43 percent faster than the IBM 180GXP. Write times in *HDTach* were equally stunning. The SCSI drive scribed data at 42.6MB/sec compared with the IDE drive's 27.7MB/sec—a 53 percent speed advantage that would aid during video capture and file server duties.

The vast performance differences in all these benchmarks—especially in the server-oriented tests—came as no surprise. The Cheetah, after all, was designed for rack-mounted torture. In a consumer-level desktop environment, however, the 180GXP's raw speed handicap isn't as noticeable. With 166 points in *SYSmark2002's* office segment (the more drive-oriented half of BAPCO's benchmark suite), the Deskstar was only five points off the Cheetah's mark of 171. We suspect this trick was achieved with the help of IBM caching algorithms optimized for the desktop environment (the Cheetah's cache is server-optimized). Bottom line: Most of a SCSI drive's benefits really only come into play in server situations. SCSI drives will give you a performance boost on the desktop, sure, but probably not enough to warrant their use by regular folks.

If you do plan on running a server, you'd do best to stay away from IDE drives. In our own Lab-crafted *IOMeter* test (designed to replicate desktop use), the IDE drive scored 150 I/Os per second. But when we ran Intel's own *IOMeter* web server script, the IBM Deskstar dropped to 143 I/Os per second. Flash forward to the SCSI drive: In the Maximum PC desktop *IOMeter* test, it scored 360 I/Os. Not bad, but in Intel's *IOMeter* web server test, the Cheetah hit 408 I/Os!

SCSI vs. IDE Drives

	Cheetah 15.3K	IBM180GXP
SYSmark2002 Office	**171**	166
HDTach average sequential read	**64.7 MB/s**	45.5 MB/s
HDTach average sequential write	**42.6 MB/s**	27.7 MB/s
HDTach random access time	**5.7ms**	13ms
IOMeter desktop total I/Os per second	**360**	150
IOMeter desktop average I/O response time	**177ms**	424ms
IOMeter web server total I/Os per second	**408**	143
IOMeter web server average I/O response time	**2508ms**	6181ms

Best scores are bolded

Copyrighted material

revolution 7.1

High-Definition Surround Sound for your PC

Revolution 7.1™

> Only PCI solution for surround up to 7.1
> High-definition 24-bit/192kHz audio up to 7.12
> Professional 24-bit/96kHz recording
> Real-time stereo-to-surround conversion
> Incredible 110dB SNR provides pristine audio

Sonica Theater™

> Only USB solution for surround up to 7.1
> High-fidelity 24-bit/96kHz audio output
> Professional 24-bit/96kHz recording
> Real-time stereo-to-surround conversion

Sonica™

> High-fidelity USB audio upgrade for PC
> Supports AC3 and DTS surround output
> Simple USB connectivity
> 24-bit/96kHz analog and optical digital outputs

TRUE 24 bit / kHz 192 SUPERIOR SOUND

M-Audio's audio cards deliver immersive surround sound on your computer rivaling even the best movie theaters. Games, movies, and music—even your stereo CDs and MP3s—all sound more alive and intense with M-Audio surround solutions. Now you can enjoy amazing new cutting-edge audio standards like 7.1 surround sound and high-definition 24-bit/192kHz fidelity. Support for popular surround formats including Dolby Digital and DTS, as well as gaming standards like Sensaura, EAX, DirectSound, and A3D insure that you'll hear everything exactly the way it was intended.

Only one name is found in more studios and used by more music professionals than any other: M-Audio. Now we've distilled all that experience into the most powerful, high-fidelity PC surround sound solutions available.

Get M-Audio. Get M-Powered.

available at
COMPUSA
WHERE AMERICA BUYS TECHNOLOGY.™

M-AUDIO®
www.m-audio.com

SPEED TRIALS

When it comes to writing CDs, how much time do you really save by using the fastest burner available?

THE TEST: The allure of high x-ratings in optical drives is almost irresistible, particularly if you're stuck with a skanky 12x burner while today's advertisements brag about 52x performance. But a 52x burner doesn't really burn 52 times faster than a 1x drive. Here's the rub: When the 2x CD burner was introduced, it was indeed twice as fast as a 1x drive. By simply doubling the disc rotation speed of the drive, the burn rate was also doubled (from 150KB/sec to 300KB/sec). But when burners hit 12x, engineers found that excessive vibrations caused by high rotational speeds generated too many writing errors, so a work-around came in the form of CAV (constant angular velocity) writing. This method spins the disc at a fixed rate, and data is transferred faster as the laser moves to the larger, outer rings of the CD.

As a result of the new CAV technology, performance speed ratings and actual burn rates became two separate metrics. With CAV burners, a drive's x-speed cleverly refers to the *top potential speed* of the disc burn, which occurs at only the outermost edge of a disc (and you'll never realize these top speeds unless you fill up a disc with data). The sober reality is that with a 52x burner, your average burn time is 40x, even when you completely pack a CD with 700MB of data.

All of which leads us to the basic question: How much speed do you really get when you graduate to drives with higher and higher performance ratings? To find out, we brushed off four old PlexWriters, and teamed them with Ahead *Nero* to see exactly how much performance-rating jumps mattered. All drives were run in our standard test bed. Yes, we could have simply used a single drive, and then lowered burn speeds within *Nero*, but that might have eliminated any gains offered by updated firmware throughout the years.

THE RESULTS: Theoretically, going from a 12x burner to a 48x ought to yield a 400 percent improvement in speed. Unfortunately, the actual speed differential is just 256 percent. In other words, about the most time you'll save on a full disc burn when jumping from 12x to 48x is 4:31 (minutes:seconds). Depending on how you use your burner, that's either thrilling or depressing. If you like to make audio CDs for your friends, we don't recommend burning at more than 12x. This will ensure compatibility with older CD-ROMs and boomboxes that have a hard time reading the lower reflectivity of discs burned at high speeds. But if you regularly archive data and media files to CD, then, yes, five minutes per disc really can make a difference.

It also pays to follow three rules to ensure you're getting the most out of your burner: (1) Always buy brand-name media rated for the maximum speed you want to burn at. (2) Make sure you have plenty of hard drive space available, and avoid doing other work while burning. Each time buffer-underrun protection kicks in, you add as much as five precious seconds to the burn process. (3) Even minor scratches and dust can dramatically slow the burn process. Handle your media like you would an angry, poisonous spider.

Performance

X-ratings	Burn times (min:sec)
12x	7:22
24x	4:16
40x	3:42
48x	**2:53**

Best scores are bolded

Ahead's Nero 5.5 vs. Roxio's Easy CD Creator 6: Which offers the fastest burn times?

THE TEST: Up until recently, our tests have shown that iterations of Roxio's *Easy CD Creator* software consistently suffered a "burn penalty." That is, all things being equal, it required about 30 seconds more than Ahead's *Nero* to complete a full disc burn. Roxio released a patch that seemed to speed things up considerably, but we wondered what the imminent release of *Easy CD Creator 6* would mean for users of Roxio's app.

Using our standard test bed, an Asus 52x drive, and Asus' own 52x media, we installed *Nero 5.5.1.0.0* and burned a full 700MB CD, timing the process from the moment we hit the burn button to the final dialog box. The test was done three times and the best time was recorded. We then wiped the partition clean, re-imaged the drive, and installed *Easy CD Creator 6,* repeating the same testing procedure.

THE RESULTS: Well, Roxio's laughing now. In a spectacular reversal of fortune, the latest iteration of *Easy CD Creator* handily beat *Nero* (2:40 for a full disc burn as opposed to *Nero's* 2:49). Adding insult to Ahead's injury, we were using a release candidate version of *Easy CD Creator 6,* as the final code wasn't available at press time. (Roxio was so confident about its software, its reps even agreed not to whine about the use of a release candidate in the event *Nero* emerged victorious.)

Of course, there's more to burning apps than just speed, and we'll do a side-by-side comparison in the near future. But Roxio clearly put some muscle into creating a better product, and from what we've seen so far, it succeeded.

Copyrighted material

Great **players** never hesitate

to **pick up** their game

or their case.

It's Gaming on the Go with The New, Ultra Light Antec LANBOY Case

Whenever. Wherever. That's your attitude when you're ready to play. And you don't need a case that will weigh you down. That's why the portable LANBOY is just for you. It makes getting to that next LAN party even easier with its lightweight aluminum body and a *free*, easy-tote carrying strap. And every LANBOY case comes with a blue LED-illuminated Antec power supply and a clear window side panel to give your gaming experience that extra edge. So pick it up today and take your game to the next level. That's *the power of you.*
To view our full line of products, visit us online at www.antec-inc.com

Antec
The Power of You

BEST BUY · STAPLES · MICRO CENTER · J&R · buy.com · GLOBAL · COMPUSA · CDW

Copyrighted material

SPEED TRIALS

A productive day of race testing comes to an end—but a full night of breaking down parts is just beginning.

Can AMD's new Athlon XP 3000+ "Barton" chip overtake Intel's finest?

THE TEST: After its Athlon XP 2800+ took a pounding from the 2.8GHz Pentium 4 in our November 2002 issue, AMD went back to the shop and began wrenching away. This time, however, AMD didn't resort to simply cranking up its clock speeds. Instead, it side-stepped the megahertz race, and *doubled* the amount of L2 cache in its chip from 256K to 512K. And thus the processor code-named Barton was born.

Why shouldn't it work? After all, Intel enjoyed quite a speed bump when it doubled its L2 cache to 512K in the Northwood P4 core.

Using a 0.13-micron process, AMD's new Athlon XP 3000+ ticks along at 2.167GHz—the same clock speed as the Athlon XP 2700+ chip—but maintains the 333MHz bus of other "Revision B" Athlon XPs. So what we have here is a larger cache, but slight back-pedaling in core clock speed (the 2800+ that we tested in November ran at 2.25GHz). Can the new AMD chip beat Intel's 3GHz land-speed record holder?

Because this speed contest is about AMD's best effort vs. Intel's best effort, we opted for 512MB of PC1066 RDRAM in the Pentium 4 machine. Our P4 motherboard was Intel's D850EMV2, which uses the 850 chipset. Although the dual-DDR E7205 chipset (aka "Granite Bay") nearly matches the promise of the 850 chipset without requiring expensive RDRAM, we felt that RDRAM still lets the Pentium 4 shine the brightest. We opted to leave Hyper-Threading enabled for the P4 tests, as we believe the technology provides a speed boost. Plus, let's face it, in the real world most people will have Hyper-Threading enabled.

For the AMD machine, we opted for the platform's best-performing chipset—nVidia's nForce2. With its 128-bit memory controller, the nForce2 simply outpaces the VIA KT400. Our memory of choice was 512MB of Corsair DDR333. Our AMD and Intel test beds used the exact same Western Digital WD1200JB hard drive, the same ATI Radeon 9700 Pro videocard, the same videocard drivers, and Windows XP Pro with Service Pack 1.

For our benchmarks, we went with the usual suspects.

▸ It's always interesting to run the *SiSoft Sandra 2003* synthetic CPU benchmark, but

Copyrighted material

the test measures theoretical performance, so its value is limited. The synthetic *SiSoft Sandra RAM* test, however, has always proved to be far more valuable, as its results are typically backed up by real-world tests.

▸ AMD still says that *SYSmark2002* unfairly favors the high memory–bandwidth capabilities of the P4, but we maintain that it's an accurate, valid benchmark and a good indicator of how fast a PC will execute office apps and content creation programs. Hopefully, we can all erase the *SYSmark* controversy with the release of *SYSMark2003*, which AMD is helping to develop.

▸ Regardless, we don't pin all our benchmark analysis on *SYSmark2002*, so we also reached for Adobe *Photoshop 7.0* and *Premiere 6.01*. Considering that our *Photoshop* file is just 9MB, and that our two test systems are loaded with 512MB of memory, we're confident that the benchmark mainly stresses the CPU, frontside bus, and memory of each PC. In our *Premiere 6.01* test, our timed action script exports an MPEG2 file using the Ligos LSX encoder. Very CPU-intensive, indeed.

▸ *MusicMatch* is one of the most popular MP3 programs available—a standard among PC users. We time how long it takes to convert a WAV file to a high-quality MP3. Be forewarned: This CPU-dependent test does take advantage of the SSE2 instructions in the P4.

▸ For gaming, we used *3DMark2001 SE*, which mostly stresses the videocard, but also relies on CPU power to render portions of the 3D pipeline. *Quake3* at 640x480 pushes the CPU and system memory bandwidth. Novalogic's *Comanche 4* is mostly a CPU stresser. We ran it at 800x600 to take the videocard's rendering abilities out of the equation. We also ran *Unreal Tournament 2003* at 640x480. Again, lowering resolutions helps remove the videocard from the performance equation.

THE RESULTS: If you wanted to test the core architectures of the two CPUs, you would plug them into the very same motherboard and isolate all possible variables. Unfortunately, that's impossible. So what we have here is a showdown between Pentium 4/850E/PC1066 and Athlon XP/nForce2/DDR333.

Long story, short: We can only render judgments based on the performance of each PC platform, and that being the case, we must regrettably call this round of PC racing a draw. Neither CPU could gain a decisive lead over the other!

While the Pentium 4 took the checkered flag in *SYSmark2002, SiSoft Sandra 2003, Quake3, Comanche,* and *MusicMatch*, the Athlon XP took *Premiere, 3DMark2001 SE, Photoshop 7.0,* and *Unreal Tournament 2003*. Now keep in mind, this is quite a turnabout for AMD. In November, the Athlon XP lost nine out of 10 speed trials.

We're wont to say that the extra L2 cache has given the Athlon XP as much of a boost as the extra 256K gave the P4 when Intel jumped from a 0.18-micron to 0.13-micron process. There are a few points to take away from this. First, consider that while the Athlon XP 3000+ has a higher performance rating than the 2800+, the 2800+ actually has a higher clock speed—2.25GHz vs. 2.16GHz. Because AMD is already producing a chip at 2.25GHz (albeit in small quantities), we're surprised the company didn't simply add extra L2 cache to a 2.25GHz or 2.3GHz Athlon XP, and send it to our Lab. This chip would have likely trounced the 3GHz Pentium 4. Is AMD delaying Barton performance increases in anticipation of its upcoming "Athlon 64" processor? One school of thought says that the upcoming 64-bit-capable CPU might run a bit slow when it arrives, and AMD doesn't want it to be outshined by Barton. A conspiracy theory, indeed, and we may never know the answer.

Second, we're surprised AMD didn't push Barton's frontside bus speed. Ever since November, it's been hinted that Barton might feature a 400MHz bus (200MHz double-pumped). With the large 512K of cache already putting Barton on the same plane as the Pentium 4, the higher-clocked bus would likely have pushed the Athlon XP past the P4.

Regardless, *Maximum PC* now officially declares the fastest Athlon XP desktop platform to be the performance equal of the fastest Pentium 4 desktop platform. In November, we weren't so sure it was kosher for AMD to market its Athlon XP 2800+ as the equal of a 2.8GHz Pentium 4, but with the Athlon XP 3000+, we think the performance rating is essentially accurate. Next month, we'll give you a full cheat-sheet on Barton upgrading, and in the year ahead, we'll run more rounds of tests as new processors are released and the CPU race heats up further.

It's a great time to be a PC speed freak! ■

Intel vs. AMD

SPECS	PLATFORM	Intel	AMD
	Clock speed	3.06GHz	2.167GHz
	Model	Pentium 4	Athlon XP
	RAM speed	PC1066	DDR333
	RAM amount	512MB	512MB (CL2)
	Bus speed	533MHz	333MHz
TESTS	SiSoft Sandra 2003 CPU MIPS	**9162**	8190
	SiSoft Sandra 2003 CPU MFLOPS	**5589**	3311
	SiSoft Sandra 2003 RAM INT	**3200**	2504
	SiSoft Sandra 2003 RAM FLOAT	**3281**	2404
	3DMark 2001 SE patched	15470	**15520**
	Quake3 1.11 Demo 1 normal	**356 fps**	320 fps
	Unreal Tournament 2003 fly-by 640x480	219 fps	**227 fps**
	Unreal Tournament 2003 botmatch 640x480	**73.1 fps**	73.4 fps
	Comanche 800x600	**59.7 fps**	55.5 fps
	Photoshop 7.0	33 sec	**32 sec**
	Premiere 6.01 export to MPEG2	361 sec	**287 sec**
	SYSmark2002 overall	**286**	248
	SYSmark2002 content creation	**407**	318
	SYSmark2002 office productivity	**201**	193
	MusicMatch 7.5 encode MP3	**146 sec**	172 sec

Best scores are bolded

Copyrighted material

CLASSIFIEDS - HELP WANTED

BOUNTY HUNTER

Recent reforms have made this position very valuable and very lucrative. Extremely dangerous. Only the strong will be considered. When you find us, you will have passed the first test.
Black Star

JOIN CAMBRIDGE'S FINEST

LIBERTY POLICE OFFICERS

The Cardamine problem is making crime more than just a statistical blip. We need someone familiar with Hunter missiles and Mark IV lasers. Must be an expert flier; we only accept the best.
1-2245.A79

RED HESSIAN

Liberty Systems. This exciting career field is what you've been looking for! Learn the skills needed to start working right now! With our 12-step training system, you'll be ready to begin

EXPERIENCED LANE HACKER NEEDED

Work in the dangerous Straits of Magellan. We don't flinch, and nothing gets by us. We're looking for a single addition to our staff, someone who can hold up to pressure and isn't afraid to take what isn't his.
1-2245.C241

BE YOUR OWN BOSS!

Liberty Systems. There's an untapped load of boron around Pittsburgh. Or so we've heard. We're looking for someone to smuggle it through the debris field. Be in the right place at the right time.

LIBERTY NAVY OFFICER

We're looking for men and women to bust pirate rings and protect the trade lanes. If you have an eye for justice, we want you.

SEEKING EXPERT FLIERS

LIBERTY NAVY

New York System. Command a fleet of heavy fighters and sweep the Badlands of Rogues. Must be an expert flier and a skilled fighter who doesn't blink under pressure.

COWARDS NEED NOT APPLY

BECOME A BOUNTY HUNTER

New Berlin System. A beleaguered police force and rapidly multiplying crime sectors have made Bounty Hunters some of the highest paid people in the solar system. It is a job of extreme danger; your abilities must be superior.

LIBERTY POLICE OFFICER

Manhattan. Justice is the only path toward enlightenment. If

INDEPENDENT MERCHANTS

New Tokyo System. Everybody wants something, and you can be the guy they get it from. There is big profit in crossing enemy lines. We will contact you.

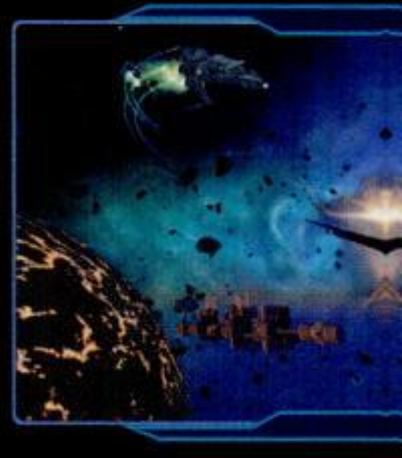
LANE HACKER

New London System. If it's independence you're looking for, we offer you the chance to disrupt the flow of cargo, bust shipments and take what you want.
1-4156.K63

MOTIVATED SELF-STARTERS WANTED

BECOME AN INDEPENDENT MERCHANT! FIND OUT HOW!

Work for yourself and make big profits! Smuggle pharmaceuticals and other commodities across enemy lines, and make your own rules. If you're interested, there are ways you can get initiated.



TEEN T Violence
CONTENT RATED BY ESRB

digitalANViL

Microsoft game studios

THE UNIVERSE, APPLY WITHIN.

Experience a vast, open-ended universe filled with an infinite number of adventures. You are the freelancer Edison Trent, an intergalactic jack-of-all-trades. Your mission: whatever you want.

©2003 Microsoft Corporation. All rights reserved. Microsoft, the Microsoft Game Studios logo, Digital Anvil, and Freelancer are either registered trademarks or trademarks of Microsoft Corporation in the U.S. and/or other countries. Other products and company

Copyrighted material

Become a smuggler or a ruthless space thug, a naval hero or a trader. Dodge through asteroid fields while piloting elite fighters. The action is endless as you make your way through 48 known star systems. Greed, morality, compassion, anger... whatever motivates you, the dynamic universe will respond. Take the first step. The universe is waiting.

FREELANCER™

The universe of possibility.

http://www.microsoft.com/games/freelancer

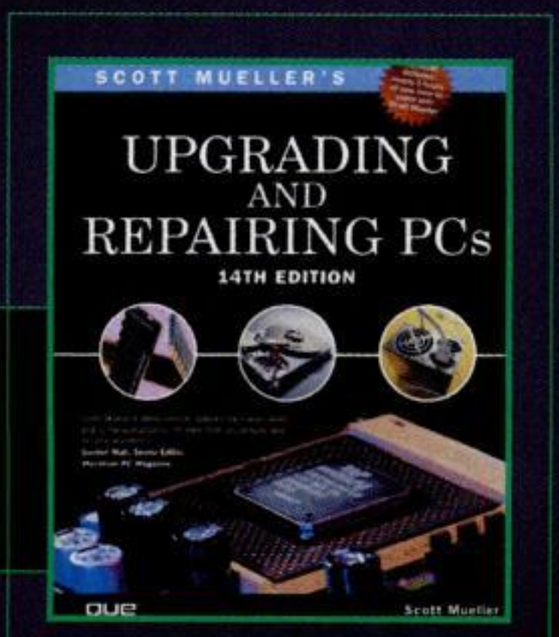
names mentioned herein may be trademarks of their respective owners. The ratings icon is a trademark of the Interactive Digital Software Association.

Copyrighted material

XP Troubleshooting Xplained

How to fix your OS woes using Window's built-in troubleshooting tools. We show you how . . .

BY SCOTT MUELLER



Scott Mueller is the author of *Upgrading and Repairing PCs,* now in its 14th edition. This 1,600-page, "Geek Tested and Approved" manual is a favorite reference source among the *Maximum PC* editors.

Copyrighted material

Your car has, oh, about 50,000 individual parts. That's 50,000 opportunities for something to go wrong, and 50,000 guesses at what your problem might be.

Windows XP, on the other hand, has more than *45 million* lines of code. If you think of these lines as "parts" within the OS, and factor in that these "parts" are often altered by apps you install or corrupted by disk failures, brownouts, and bad juju, then you can see why your system goes awry so often.

Fortunately, getting WinXP back up to speed is a lot less expensive and painful than doing the same with your comparatively simple automobile. That's because Microsoft included error-reporting features, diagnostic programs, and utilities that can help you root out the cause of a system snafu—all before resorting to the dreaded reinstall.

As a continuation of our Ultimate Fix-It Guide from last month, we're going to show you how to decode the error messages left behind by Windows XP after crashes, and explain how to use the tools built into the OS to become your own mechanic. You'll be diagnosing problems, recovering from system mishaps, and maintaining a working machine in no time.

WHAT is Windows XP trying to tell me?

The most serious PC problems can be caused by corrupt files and buggy software, as well as defective or incorrectly configured hardware. These problems often result in a STOP or "blue-screen" error. The resulting "screen dump" is a frustrating and cryptic string of letters and numbers. But often these messages can be decoded to provide some useful information. For example, say you're working on a system that STOPs (blue-screens) with the following message:

```
STOP: 0x0000002E
(0x00699F11, 0x04EBD77F,
0x00000000, 0x80ADD9C8)
DATA_BUS_ERROR
```

The best thing to do when you get a STOP or blue-screen error like this one is to look up the error code (the first string of letters and numbers after STOP:) in the Microsoft Knowledge Base at **http://support.microsoft.com**. There you'll find articles that will help you decode the specific error you're receiving, and helpful information about troubleshooting the problem.

The Knowledge Base tells us that the 0x0000002E code indicates a parity error detected in memory. An error like this is normally caused by problems with memory, but can also be caused by other hardware such as a videocard, a failing hard disk, a boot sector virus, or even a defective device driver. The message in our example includes four parameters (in the parentheses) that provide valuable information. The parameters for this error are decoded as follows:

- Virtual address of the fault (0x00699F11)
- Physical address of the fault (0x04EBD77F)
- Processor Status Register contents (0x00000000)
- Faulting Instruction Register contents (0x80ADD9C8)

Of these, the second one (the physical address) is the most useful, as it indicates the exact location in memory where the fault occurred. In this case the address was 0x04EBD77F, which is a hexadecimal number that translates to 82,564,991 in decimal, which if you divide by 1,048,576 (number of bytes in a megabyte) places the error at 78.74 as a megabyte address, which is the same as saying the error is in the 79th megabyte (addresses start with 0). If you had two 128MB DIMMs in the system, then this would place the error in the first bank of the two installed.

Now if this error reoccurs, and the address is the same every time, then the problem is most likely the memory module, which should be replaced. If the error reoccurs but the address is always different, then I would suspect other hardware or software in the system instead of just the memory modules.

While not all STOP errors utilize the parameters in the same manner, the first place to start is always the Microsoft Knowledge Base. Hey, they're the ones that came up with these codes in the first place!

Copyrighted material

BETTER living through device management

The Device Manager is the software component of the plug-and-play standard, and it should be the first place to look if you're having problems installing a new piece of hardware, or to resolve conflicts between devices. You can use Device Manager to show you a graphical view of the hardware that's installed in your computer, get detailed listings of resource usage, update hardware device drivers, change settings, and troubleshoot problems. To open Device Manager, select Start > Control Panel > Performance and Maintenance > System. On the Hardware tab, select Device Manager.

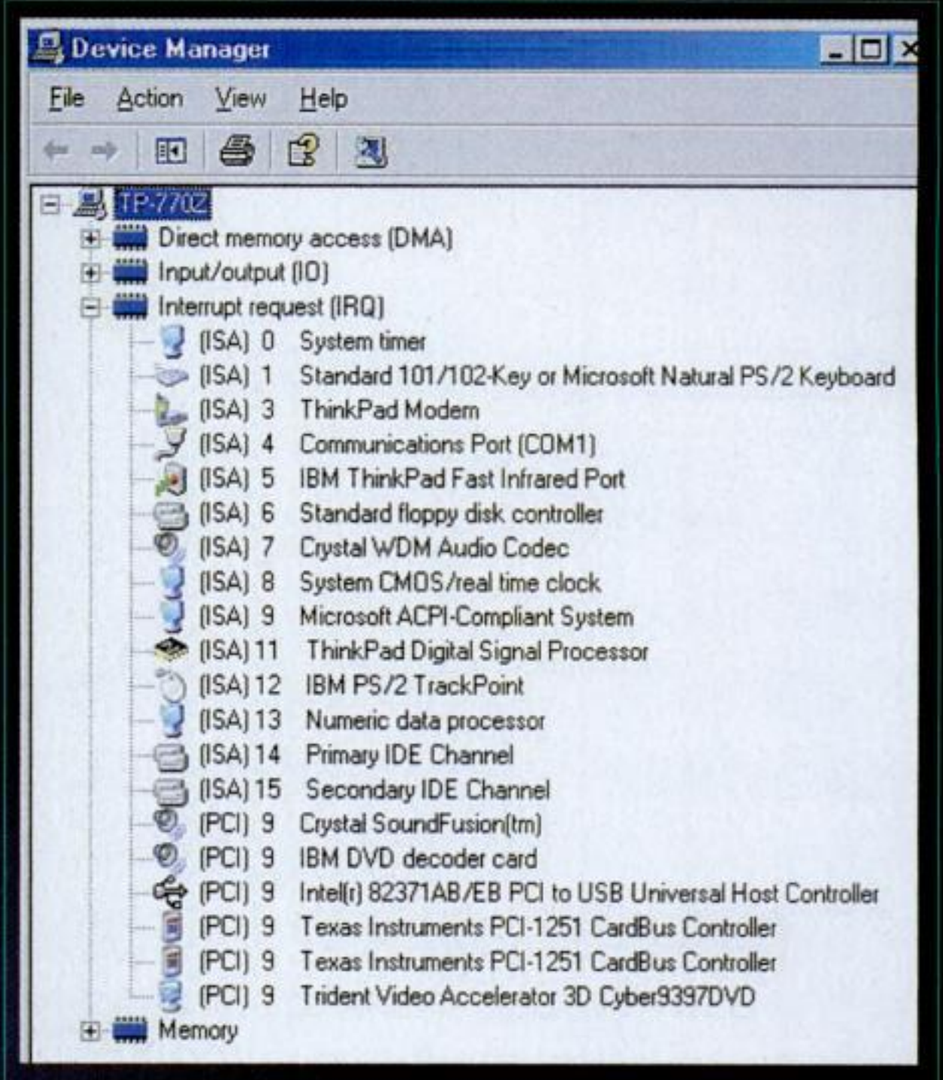
The primary uses for Device Manager include:

- Check to see if the installed hardware is recognized and working properly.
- Change hardware resource configuration and device settings.
- Identify installed drivers.
- Install updated drivers.
- Enable, disable, or uninstall hardware devices.
- Roll back to a previous driver version.
- Print a summary of the devices that are installed on your computer.

Normally, the automatic plug-and-play features in Device Manager will properly configure all the installed hardware in such a way that there are no conflicts. Especially in newer systems running WinXP, it's rare that you'll need to manually edit or modify the resource allocation of devices. In general, the settings should be left on automatic. By setting resources manually, you risk causing problems, and your system may even lock up. If that happens, try starting in Safe mode: Reboot the PC, and hold down the F8 key while the system restarts to access the Safe Mode option, then open the Device Manager and reset everything back to automatic. Once you restart, the plug-and-play routines will take over and should resolve any critical conflicts.

Another useful feature of the Device Manager is that it lets you see resource usage at a glance. For example, to check for any IRQ resource conflicts, go to the View menu, select Resources by type, and then click Interrupt request.

An IRQ is a signal that a device uses to gain the attention of the processor. Most all devices that communicate data to and from the system will require an IRQ, since they will need to request the attention of the processor as data comes in. Without this type of design, buffers on the device may overflow before the processor decides to check to see if the device needs attention. Older ISA bus devices can't normally share IRQs, while PCI devices can share them. Problems can occur if you have a lot of older ISA bus devices in a system, since there are only 16 total IRQs, and many of them are reserved for specific uses. In my system, there's only one free IRQ (IRQ 10), meaning I can add only one more ISA bus device before I'll have allocation problems. On the other hand, I can add more PCI-based devices because they can all share IRQ 9. Note that the PCI bus is designed to remap shared IRQs (called IRQ steering), so having multiple devices on a single IRQ doesn't present a problem.


Device Manager
File Action View Help
TP-770Z
Direct memory access (DMA)
Input/output (IO)
Interrupt request (IRQ)
(ISA) 0 System timer
(ISA) 1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
(ISA) 3 ThinkPad Modem
(ISA) 4 Communications Port (COM1)
(ISA) 5 IBM ThinkPad Fast Infrared Port
(ISA) 6 Standard floppy disk controller
(ISA) 7 Crystal WDM Audio Codec
(ISA) 8 System CMOS/real time clock
(ISA) 9 Microsoft ACPI-Compliant System
(ISA) 11 ThinkPad Digital Signal Processor
(ISA) 12 IBM PS/2 TrackPoint
(ISA) 13 Numeric data processor
(ISA) 14 Primary IDE Channel
(ISA) 15 Secondary IDE Channel
(PCI) 9 Crystal SoundFusion(tm)
(PCI) 9 IBM DVD decoder card
(PCI) 9 Intel(r) 82371AB/EB PCI to USB Universal Host Controller
(PCI) 9 Texas Instruments PCI-1251 CardBus Controller
(PCI) 9 Texas Instruments PCI-1251 CardBus Controller
(PCI) 9 Trident Video Accelerator 3D Cyber9397DVD
Memory

If you look at the Device Manager for my system, you'll see a number of devices sharing IRQ 9, for example, since all of those devices are PCI based.

GETTING the 411 from System Information

WinXP includes a powerful System Information utility that can display system configuration information for both local and remotely connected computers. To run System Information, select Start > Programs > Accessories > System Tools > System Information. The main display in the System Information program includes the following categories:

- Hardware Resources (similar to Device Manager)
- Components (hardware)
- Software Environment (installed drivers, programs, services)
- Internet Settings

System Information will not only display the information on the screen, but it can also save or print a complete report about your system. This can be very useful if somebody is helping you troubleshoot the system remotely. By sending along the file or printout, the troubleshooter will have a lot of important information about your system

Copyrighted material

that may be useful in diagnosing a problem. System Information can also be used as a launching point, from the Tools menu, for several other valuable utilities that are described in the following sections.

Network Diagnostics

Network Diagnostics is designed to collect and display information about your hardware, operating system, Internet browser and e-mail program configurations, modems, and network cards. It should be your first stop in diagnosing "connectivity" problems, and will often point you directly to the culprit.

System Restore

System Restore is a very useful tool that's designed to store and track changes made to your system. WinXP will normally create what's called a "restore point" automatically whenever you install new hardware, drivers, or software. You can also use the tool to manually create restore points anytime you like. This is similar to how many game programs allow you to save your current position, so if you "die" in the game, you can reset to the previously saved position rather than having to start over. In working with PCs, this can be a valuable timesaver. Once restore points are created, you can use the System Restore program to restore your computer to an earlier state.

File Signature Verification

The system files and drivers provided with Windows XP have a special digital signature by Microsoft, which indicates that they are original, unaltered files that have been approved by Microsoft for use with Windows. Problems can arise when installing new software or drivers on your computer, as in some cases your original files can be overwritten by unsigned or incompatible versions.

To check for problems with critical files, Windows XP provides the File Signature Verification utility, which is designed to identify and display the following information for any unsigned files on your system:

- Filename
- Location
- Modification date
- Type
- Version number

By clicking on the Advanced options, you can also root out third-party drivers that haven't been digitally signed, which means these drivers haven't necessarily been approved by Microsoft for use with WinXP. If you find drivers like these, check the manufacturer's web site for updated drivers, especially ones that have received WHQL (Windows Hardware Quality Labs) certification.

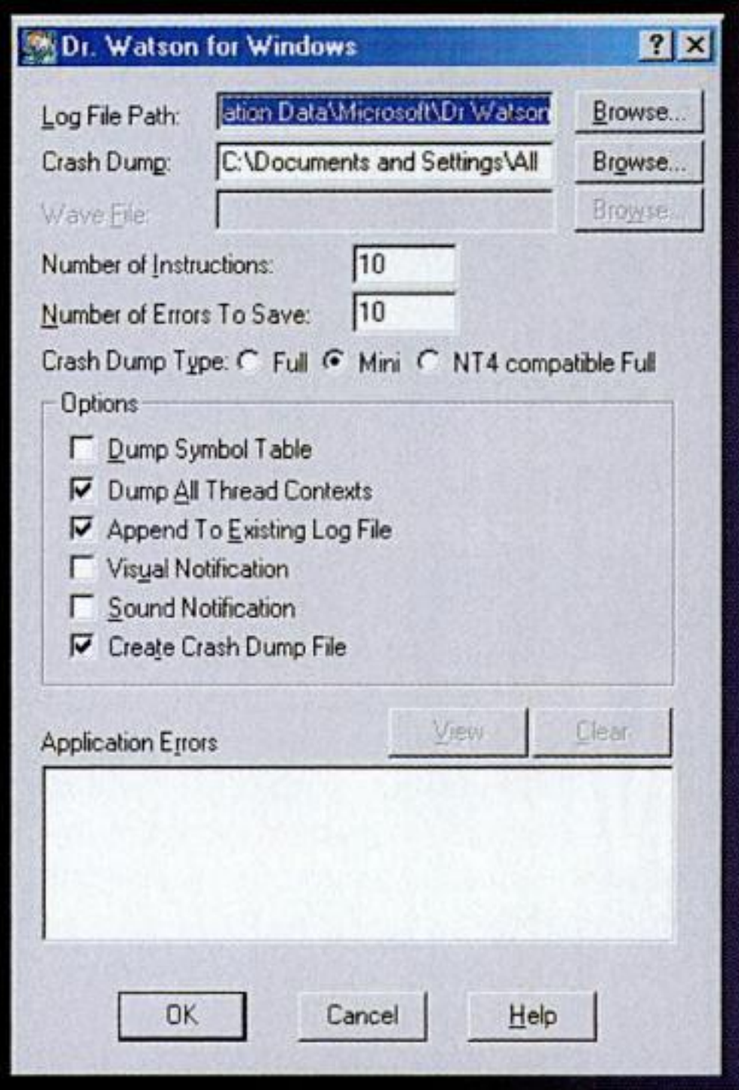
DirectX Diagnostic

Graphics and sound applications commonly use the DirectX API (application program interface) to run under Windows. Because of the variety and complexity of graphics hardware and software, there can sometimes be problems with various videocards, drivers, and programs that work with DirectX. The DirectX Diagnostic tool can give you information about the DirectX components and drivers on your system. This tool enables you to test sound and graphics output and enables you to adjust or disable certain hardware acceleration features for compatibility and testing purposes.

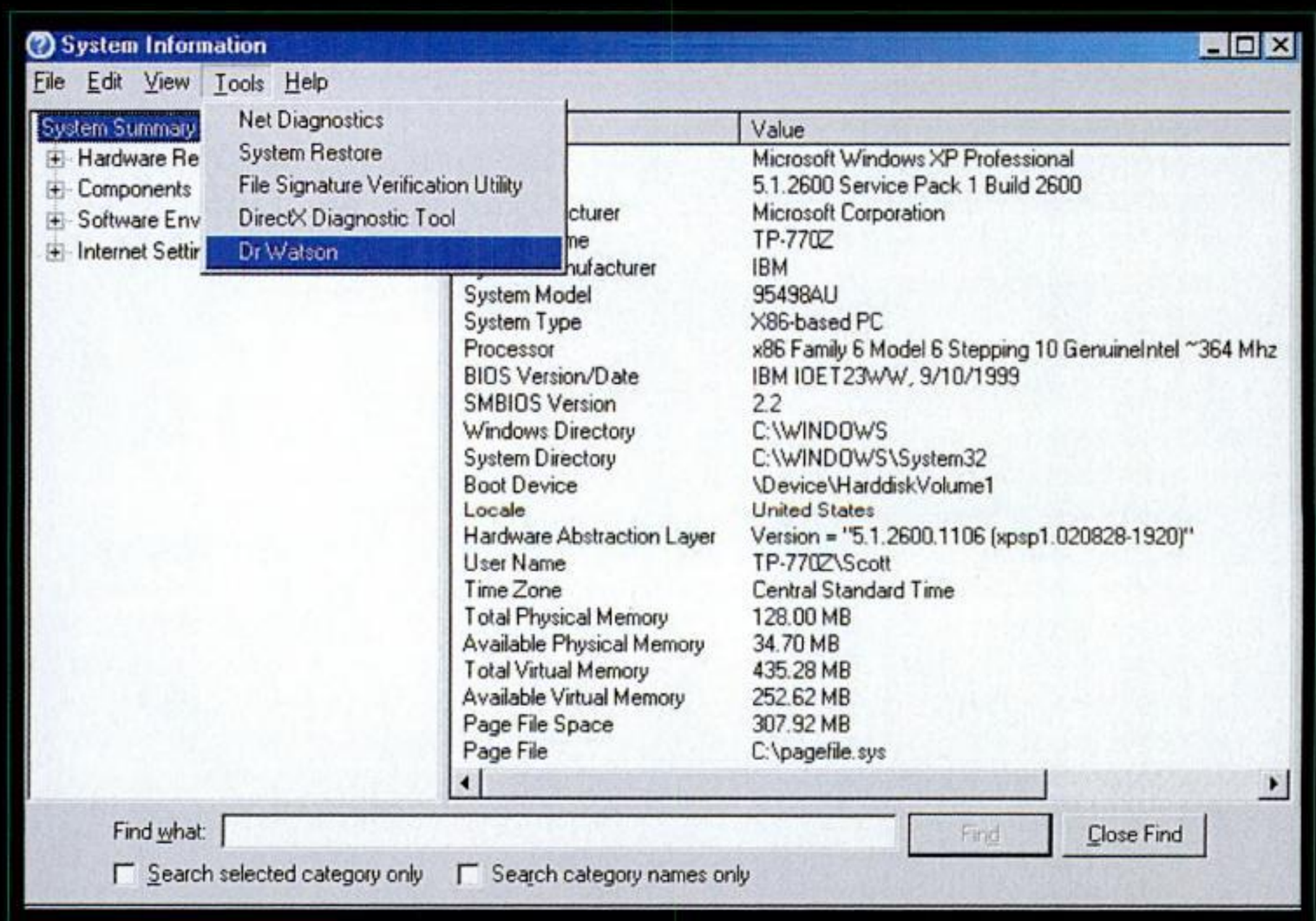
Dr. Watson

Dr. Watson for Windows is a software error-debugging tool designed to log information when errors occur. A text file (Drwtsn32.log) is created whenever an error is detected, and can be printed or sent to Microsoft or other software companies to help verify and resolve bugs in software.

Dr. Watson is automatically installed in your system folder when you install Windows. If a program error occurs, Dr. Watson will automatically log the error. You can also start Dr. Watson manually to change the configuration and settings for the program.



Programs that consistently crash can be triaged with the Dr. Watson utility, which captures information about what went wrong for examination later.



The System Information utility isn't just a great resource for information about your PC. It's also a launching point for a toolbox full of great diagnostic utilities.

Copyrighted material

OPEN HEART
surgery with DiskProbe
Live dangerously with WinXP's coolest drive diagnostic tool

Microsoft includes a very powerful set of support tools located in the \Support\Tools folder on the XP Professional CD (these are unfortunately not included in the XP Home version). For descriptions of all the tools, Microsoft provides online documentation via release notes and a help file. Also there's much more information on these tools in the Windows XP Resource kit, which you can view online at www.microsoft.com/windows/reskits/default.asp.

One of the more powerful and interesting programs included in the Windows Support Tools package is DiskProbe, a sector editor utility. DiskProbe allows you to read and write individual physical or logical sectors on a drive, and has special features for decoding and editing the Master Boot Record (MBR), partition tables, and volume or partition boot sectors. Because these structures are literally outside of the file system on a drive, they are not accessible through most other applications. With this tool, a knowledgeable user can restore these important data structures if they are damaged, for example by a boot sector virus.

In addition to editing, you can also use DiskProbe for preventive maintenance, by making backups of these critical sectors as files, which can be stored on another disk (such as a floppy for example). Once saved, they can be later restored in the event that these sectors are corrupted on your hard drive.

To run DiskProbe, first make sure you have installed the Windows Support Tools from the Windows XP Professional CD. Then select Start > Windows Support Tools > Command Prompt. At the prompt, enter Dskprobe. The program will then launch in a window. Optionally you can run the program by opening Windows Explorer and navigating to the \Program Files\Support Tools folder, then clicking Dskprobe. The documentation for the program is available via the Help command on the menu bar.

Note that editing critical sectors such as the MBR is like performing open-heart surgery on your system. DiskProbe and other sector editors like *Norton DiskEdit* function at a level below the Windows file system, which means that the standard safety protocols are not in effect. DiskProbe gives you access to every byte on the physical disk without regard to normal security or access privileges, which makes it possible to damage or overwrite critical areas of the disk. If you change so much as a single byte inappropriately, you could render your system non-bootable and possibly render the drive unrecognizable even if the system is booted from a floppy or CD!

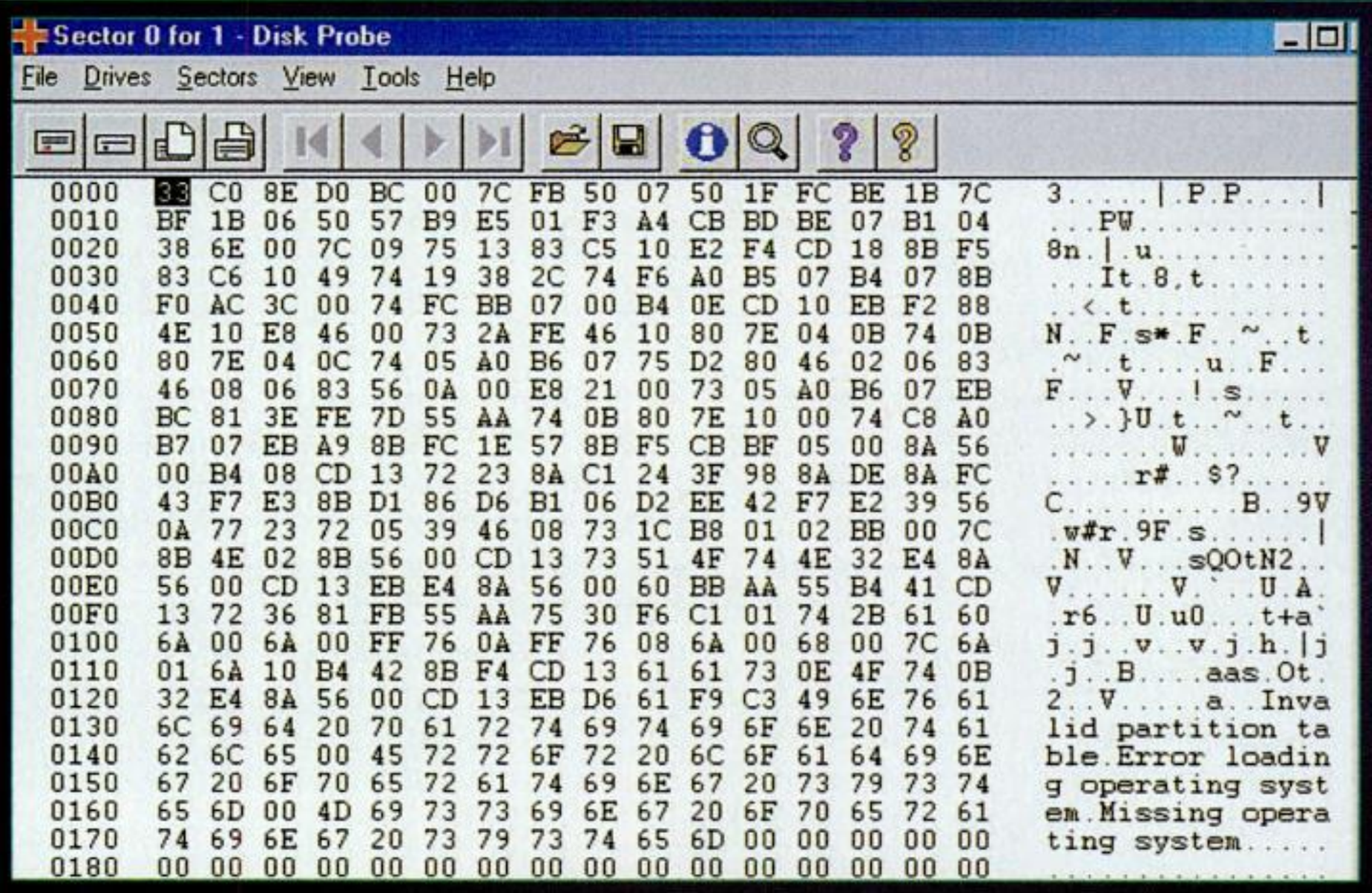
Fortunately DiskProbe defaults to read-only mode, which means you can run the program to view sectors without worrying about accidentally making changes. Before you do make any changes with a low-level tool such as DiskProbe, make sure you have a backup of any important data.

I have specialized in data recovery for many years, and in that line of work I regularly use sector editors like DiskProbe to restore critical boot sectors on hard drives that had otherwise been inaccessible to Windows.

In a recent example, a client of mine appeared to have lost hundreds of hours of video footage due to a hard drive crash. To solve the problem, I did a manual inspection of the MBR and partition boot sectors. The drive had been formatted with the FAT32 file system, and I very quickly discovered that somehow the first sector of the three-sector long FAT32 partition boot sector, which was at Logical Block Address (LBA) 63, had been overwritten with zeros. I knew from experience that FAT32 keeps a backup copy of the primary partition boot sectors at LBAs 66 through 68. So I used DiskProbe to copy sector 66 and paste it to sector 63, thereby solving the problem.

A job like this would cost hundreds to possibly thousands of dollars if sent to a professional data recovery service. Now you see why most people who know data recovery don't like to teach it.

Except me, that is. ■



If you've got a steady hand and some experience with hex editing, Disk Probe can rescue you from major hard disk calamities.

Copyrighted material

VISIONARY/CONSULTANT

Makes the presentations
Develops new prospects
Stays a step ahead
Returns the calls
Makes quality time for family

DIRECTOR OF COMMUNICATIONS

Prints color and B/W documents
Copies all documents or bound reports
Faxes are received on plain paper
Scans in color at the touch of a button
Makes you look good

MFC-5200c
COLOR FLATBED MFC
About $349

Our Multi-Function Center® Models Do Everything. Just Like You.

No matter where or how you work, our all in one MFC's are designed to work for people like you. And with over 10 PC or Mac compatible models to choose from, finding the one with the performance and price you're looking for is easy.

Some even have the ability to print from your digital camera media card! If you need a multi-function solution that works almost as hard as you do, you don't need five separate machines, all you need is the right one.

A VARIETY OF MODELS AVAILABLE AT: **Office Depot, OfficeMax, Staples, J&R ComputerWorld, Global Computer Supplies, MicroCenter, Fry's, PC Connection, MicroWarehouse, CDW, Insight, PC Mall, Quill, Viking, Dell, Amazon.com, Gateway.com, Buy.com and 4Sure.com**

At your side.™

brother®

© 2002-2003 Brother International Corporation, Bridgewater, NJ • Brother Industries Ltd., Nagoya, Japan
For more information please call the Brother Fax-Back System at 800-521-2846 or visit our web site at www.brother.com

Copyrighted material

MAJOR LEAGUE MODS

Behold! The world's best case modders battle for supremacy, deep in the heart of Texas

3rd place: *"Frostbyte"*

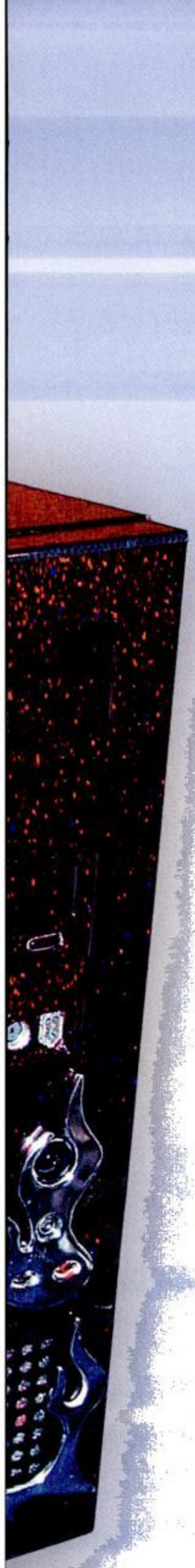
by Gareth "Lord Pheaton" Powell

There's no denying that this case looks *cool*—as well it should, considering it was meant to resemble a PC frozen in a block of ice. The design process involved extensive experimentation with various plastics and resins to find the material that most effectively simulated the look of ice. Next came the creation of a custom-made case mold, which was ultimately filled with four gallons of clear casting resin to create the PC's unique housing.

An integrated 15-inch monitor, dual cold-cathode lighting, and custom-made switch covers to mask the controls are all included in the case's design, while the main components of the system are mounted to a fold-out door in the rear. A 90 degree AGP riser card was used to accommodate a GeForce4 Ti 4400 videocard and serves to prevent airflow restriction inside the unit.

Reprinted material

Twice a year, PC gamers from more than 20 different countries converge in Dallas, TX, for Cyberathlete Professional League showdowns—mano a mano battles among the computer gaming elite. The five-day affair is most famous for its high-stakes multiplayer death matches, but it's also host to the Consummate Case Contest (C3), wherein case modders get the chance to really strut their stuff. Judged on eight separate criteria including artistic impression, workmanship, and functionality, several winners are chosen, first through fifth place. Follow along as we tour the visual majesty of the winning entries...



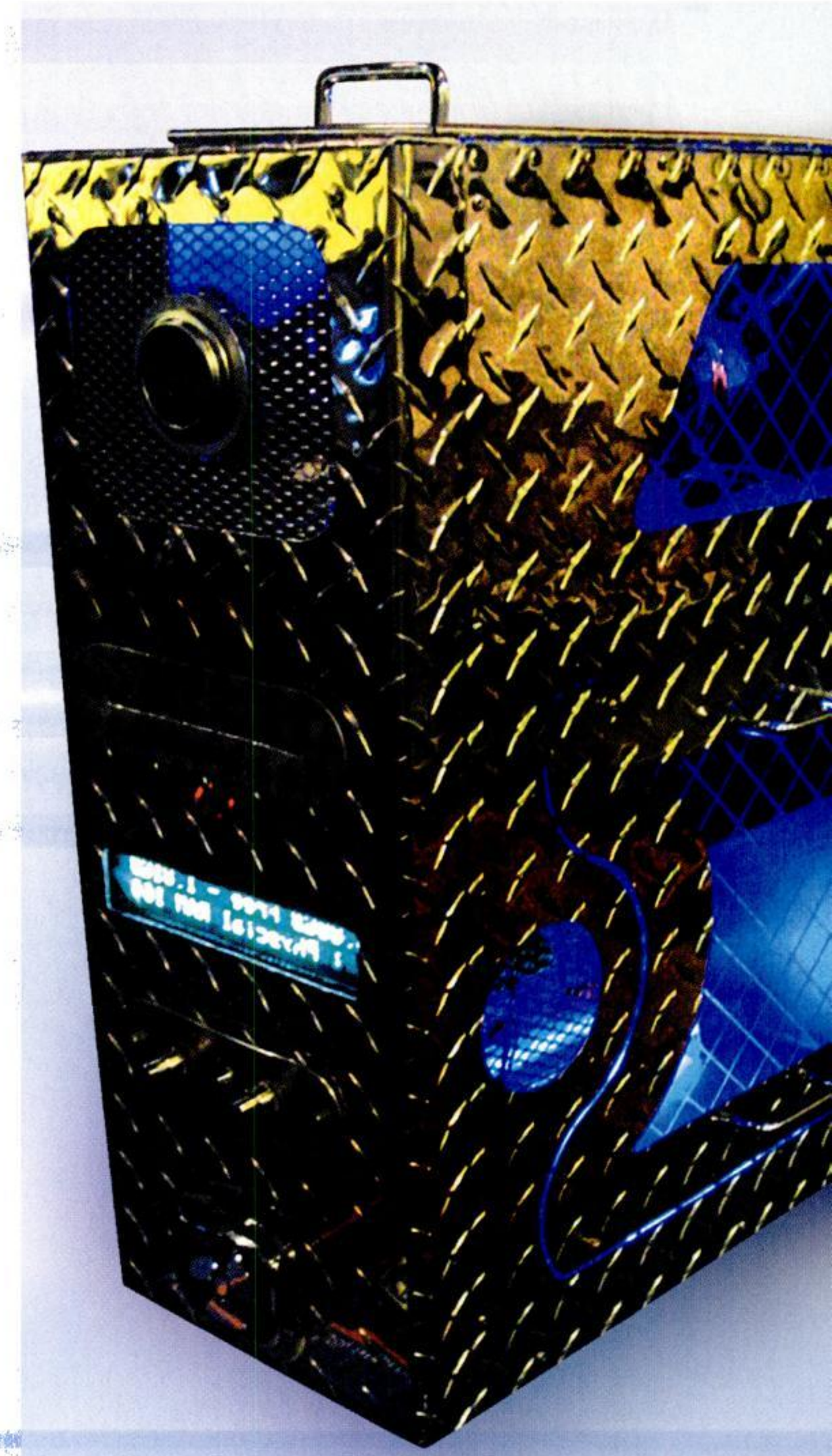
1st place:

"Reign of Fire"

by Marc "Geezer" Weitz

In making his case, Marc used almost every metal treatment known to man. The unit started life as a plain Lian Li aluminum case and was cut, formed, plated, and painted to become the masterpiece you see here. The case pays tribute to the dragon from *Reign of Fire*, but the real star of this design is the custom berry-wine finish that's set off by the sprayed flames accenting the case's sides.

The dragon was precision machined by a water-jet cutter, then backed by red acrylic. The top of the case prominently features the radiator for the water-cooling system inside. Marc then finished the top panel with a chrome flame accent. On the front, a 5.6-inch LCD resides where the floppy drives would normally go. Custom flames adorn the lower portion of the case and surround the power button. If only such craftsmanship had gone into the movie that is this case's namesake!



2nd place:

"Cold Fusion"

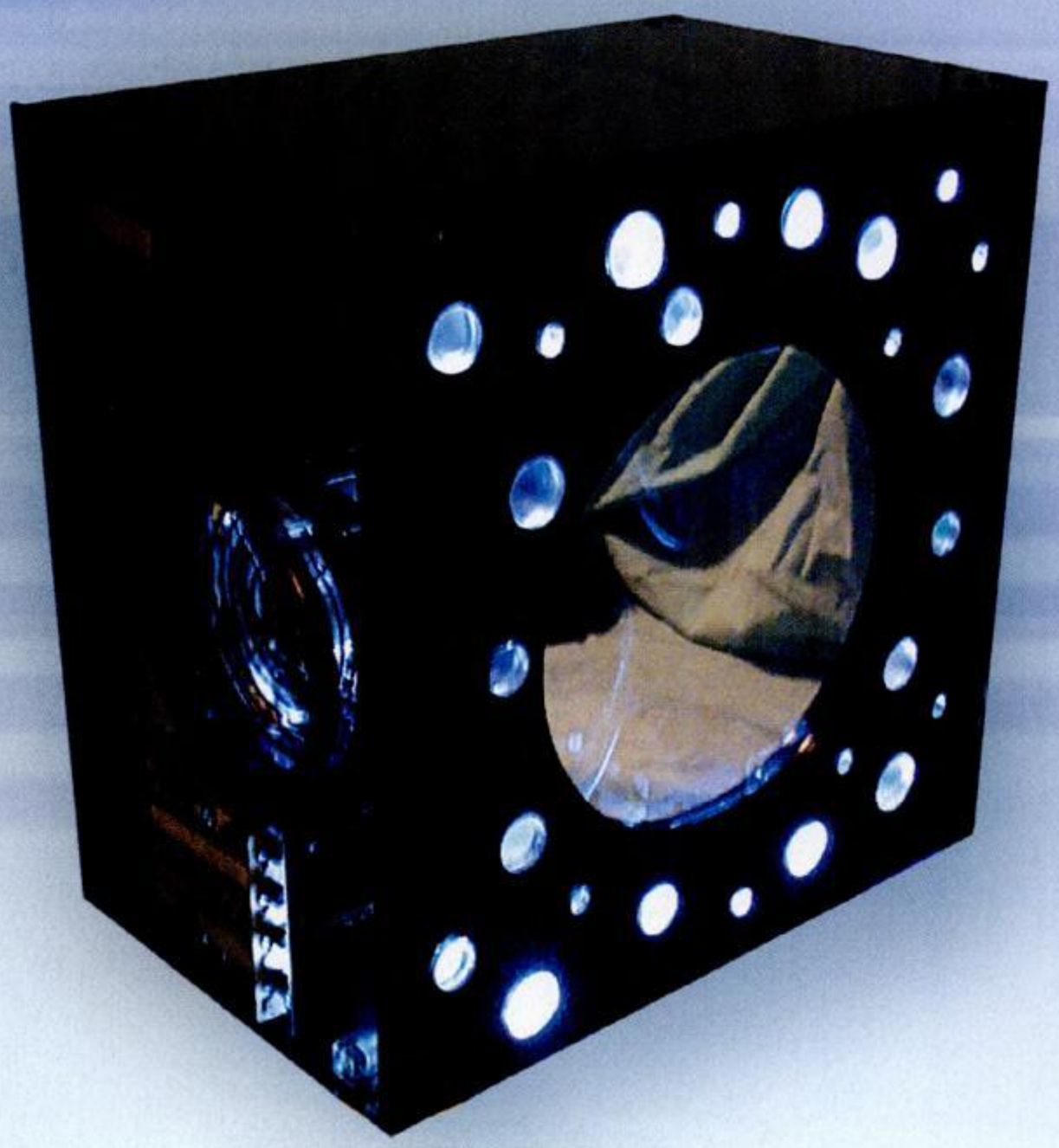
by Anthony "[H]amHouke" Stanley

A Vapochill refrigeration unit keeps the 2.2GHz processor at a chilly minus 10° C, even when it's overclocked to 2.966GHz! The entire enclosure was hand-formed using diamond plate aluminum sheets that were bent and cut to size. Acrylic inserts scored with a diamond pattern were then added to enhance the case's industrial look and allow onlookers to admire the componentry within. The radioactive emblem on the front of the case is surrounded by a clear flange that glows blue when the hard drive is active. A vacuum florescent display outputs system information, text, and temperatures in realtime. And to top it all off, Cold Fusion was hand polished and lit with four blue liquid neon lights. Magnificent.

Copyright Maximum Media

MAJOR LEAGUE MODS

Thanks to Lord Pheaton, Gruntman, and Geezer for providing photos for this article. For more information on these cases and others, point your browser to www.pheatonforums.com, where you can find in-depth work logs of many of the rigs you see here.



4th place: *"Monolith"*

by Barry "Cold Dog" Collins

Although its name suggests something large and looming, at fewer than 15 inches tall, the Monolith case has a relatively modest profile. (But no doubt its creation was a monumental undertaking.) Built almost entirely from smoked acrylic, the Monolith was specifically designed to be assembled without tools. Each of the six separate panels that make up the enclosure are held together with thumbscrews, and the case can be assembled or disassembled in a matter of minutes. The case also features a large VFD panel up front, three-position fan-speed controllers, and a custom-made temperature display. The left panel of the case sports a two-way mirrored window (a unique twist on the conventional window mod), and frosted glass inserts give the case a celestial aspect. Indeed, it's out of this world!

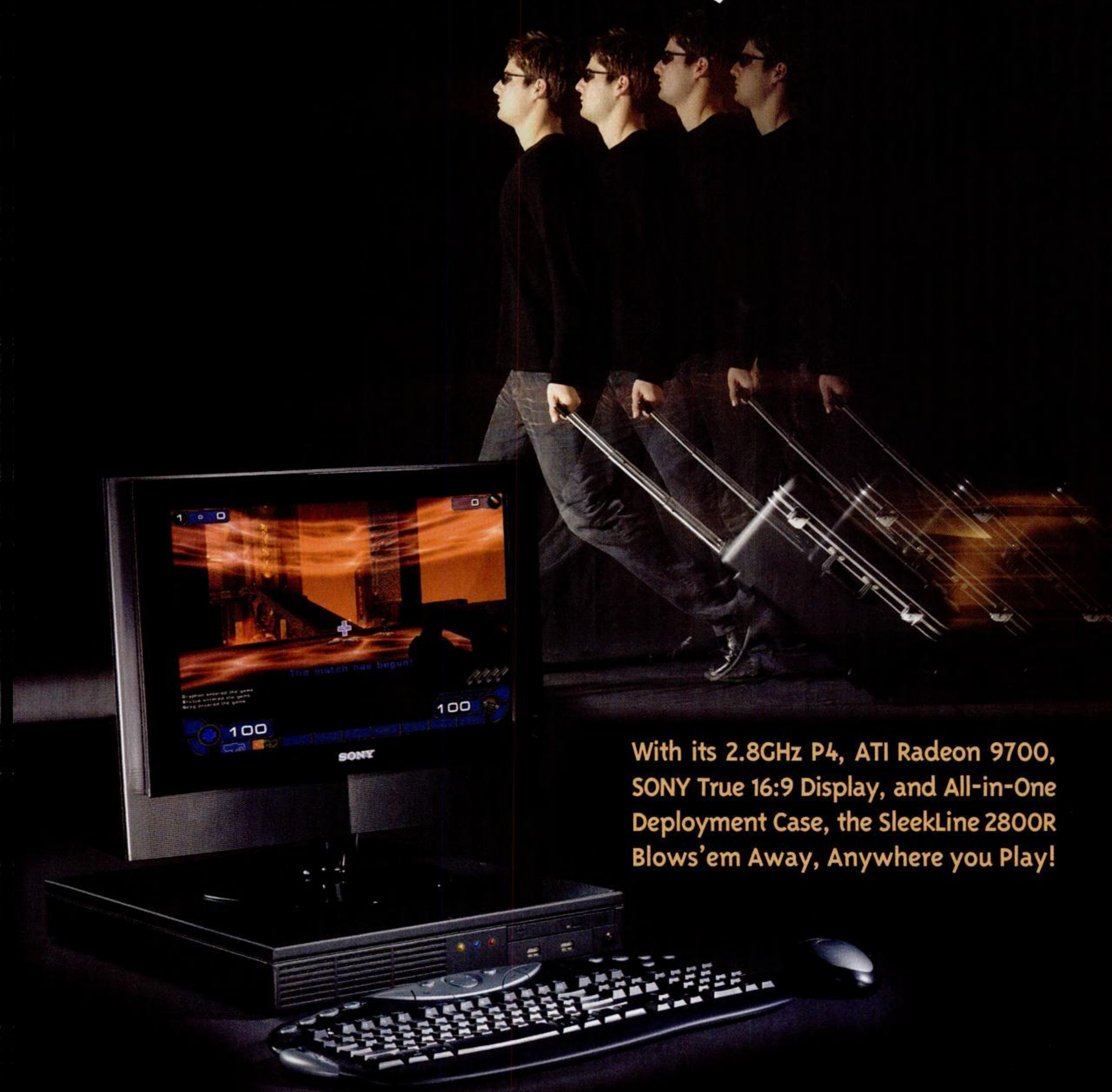
5th place: *"Mac Mod"*

by Val Sledz

Many of us would like to gut a Mac and give it a PC transfusion, but few of us actually go through with it. Well, Val Sledz did. His vision was to remove the original innards from an iMac and replace them with their PC counterparts, a simple idea that proved harder than Val had originally anticipated. In the end, however, he managed to cram a full-on gaming rig into the transparent shell, including a slot-load DVD drive and a Ti 4600 videocard. Val says the most challenging part of the project was first finding, then fitting, the 15-inch Sony LCD monitor into the casing. Finishing touches include clear LED fans and a Mac-esque skinning of Windows XP to give it that OS X feel without sacrificing PC performance.

Copyrighted material

Roll'n with Rock'n Performance.



With its 2.8GHz P4, ATI Radeon 9700, SONY True 16:9 Display, and All-in-One Deployment Case, the SleekLine 2800R Blows'em Away, Anywhere you Play!

SleekLine® Systems

Space-Saving Computing *Without* Compromise™

www.sleekline.com 5995 Avenida Encinas, Carlsbad, CA 92008 (800) 722-6555

Made in the USA. Includes 3-Year Warranty and Free Professional 24/7 Support. SleekLine is a Division of PC Power & Cooling, Inc. Est. 1985

Screen Capture from Unreal Tournament 2003 ©2002 Epic Games. SleekLine is a Registered Trademark of PC Power & Cooling, Inc. ©2003

Copyrighted material

Don't Fear The Beeper

When your PC beeps instead of boots, it's time to diagnose your POST codes. Submitted for your approval, a comprehensive guide to boot-up errors for the old-school Hessian hardware hacker.

Tucked into your PC's ROM-BIOS chip is a series of diagnostic routines that run every time you start your rig. Called the Power-On Self Test, or POST, these routines go from one subsystem to another, beginning with the power supply and ending with the video subsystem, confirming that each subsystem is functioning correctly. If a tests fails, the PC won't boot—but you will get a Morse Code-like series of beeps to let you know what subsystem didn't check out.

They're the gasps of a PC in deep doo-doo, but there's no reason to be afraid of POST beeps, Garth. In fact, they can save you hours of troubleshooting by immediately pointing you to offending components. The three major BIOS companies—AMI, Award, and Phoenix—use different codes to express different kinds of errors. Get them mixed up, and you could end up pulling your RAM when you ought to be plugging in your keyboard. You can find out what kind of BIOS you have by watching the top of your screen immediately after powering up your PC. You'll see the BIOS manufacturer's name just before the number of the BIOS revision. If you miss it, just boot up again.

We've listed the complete error codes for each manufacturer. In the following charts, the first column describes what kind of beep pattern you'll hear. The second column indicates what kind of problem is being reported. The third column lists, in order, what steps you should take.

So stop cowering, and start listening. Even if you never hear a beep code, these charts offer invaluable pointers to the kinds of problems a PC can suffer, and can inform troubleshooting strategies for other types of PC mishaps (like the dreaded brewski-in-the-fan-grill spill).

Copyrighted material

Don't Fear the Beeper

AMI BIOS POST Beep Codes

Beeps	Error Description	Action
1	Memory Refresh Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
2	Memory Parity Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
3	Base 64KB Memory Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
4	Timer Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
5	Processor Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Make sure the processor and heatsink are installed properly, remove and reseat. Replace the processor. Replace the motherboard.
6	8042 – Gate A20 Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the keyboard. Replace the motherboard. Replace the processor.
7	Processor Exception Interrupt Error	Make sure the processor and heatsink are installed properly, remove and reseat. Replace the processor. Replace the motherboard.
8	Display Memory Read/ Write Error	Check the videocard for proper installation. Try replacing the videocard memory. Replace the videocard. Replace the motherboard.
9	ROM Checksum Error	Try reseating the motherboard ROM chip. Try reflashing the motherboard ROM. Replace the motherboard.
10	CMOS Shutdown Register Read/Write Error	Replace the CMOS battery. Replace the motherboard.
11	Cache Memory Bad	Make sure cache settings in BIOS Setup are properly configured (e.g., is the L2 cache dis abled?). Replace the processor. Replace the motherboard.
1 long,	Conventional/ Extended Memory Error	Clean the memory contacts, reseat the modules. Remove all modules except the 3 short first bank. Replace the memory. Replace the power supply. Replace the motherboard.
1 long,	Display/Retrace Error 8 short	Check the videocard for proper installation. Try replacing the videocard memory. Replace the videocard. Replace the motherboard.

Award BIOS POST Beep Codes

Beeps	Error Description	Action
1 long, 2 short	Videocard Error	Check the videocard for proper installation. Try replacing the videocard memory. Replace the videocard. Replace the motherboard.
1 long, 3 short	Videocard Error	Check the videocard for proper installation. Try replacing the videocard memory. Replace the videocard. Replace the motherboard.
Continuous Beeps	Memory Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.

Charts and troubleshooting advice provided by Scott Mueller, author of *Upgrading and Repairing PC's*, a **must-read** for all PC enthusiasts.

Soft White Underbelly. Travesty. The Disciples. These were all previous incarnations of the band we know today as Blue Öyster Cult.

Copyrighted material

Phoenix BIOS 5.x and earlier POST Beep Codes

Phoenix uses a concatenated system of beeps separated by brief pauses, instead of the conventional long/short beep. So a beep code that reads 1-2-1 means that you'll hear one beep, pause, then two beeps, another pause, then another single beep.

Beeps	Error Description	Action
1-2	Videocard Error	Check the videocard for proper installation. Try replacing the videocard memory. Replace the videocard. Replace the motherboard.
1-3	CMOS RAM Read/Write Error	Replace the CMOS battery. Replace the motherboard.
1-1-4	ROM Checksum Error	Try reseating the motherboard ROM chip. Try reflashing the motherboard ROM. Replace the motherboard.
1-2-1	Timer Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
1-2-2	DMA Initialization Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
1-2-3	DMA Page Register Read/Write Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
1-3-1	RAM Refresh Verification Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
1-3-3	First 64KB RAM Multibit Data Line Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
1-3-4	First 64KB RAM Odd/Even Logic Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
1-4-1	First 64KB RAM Address Line Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
1-4-2	First 64KB RAM Parity Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
2-1-1	First 64KB RAM Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
3-1-1	Slave DMA Register Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
3-1-2	Master DMA Register Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
3-1-3	Master Interrupt Mask Register Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
3-1-4	Slave Interrupt Mask Register Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
3-2-4	Keyboard Controller Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the keyboard. Replace the motherboard. Replace the processor.
3-3-4	Screen Initialization Error	Check the videocard for proper installation. Try replacing the videocard memory. Replace the videocard. Replace the motherboard.
3-4-1	Screen Retrace Error	Check the videocard for proper installation. Try replacing the videocard memory. Replace the videocard. Replace the motherboard.
3-4-2	Video ROM Error	Check the videocard for proper installation. Try replacing the videocard memory. Replace the videocard. Replace the motherboard.
4-2-1	Timer Interrupt Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
4-2-2	Shutdown Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the keyboard. Replace the motherboard. Replace the processor.
4-2-3	Gate A20 Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the keyboard. Replace the motherboard. Replace the processor.

Before he invented the electric telegraph and the code that bears his name, Samuel F. B. Morse was a successful artist and portrait painter.

Don't Fear The Beeper

Phoenix BIOS 5.x and earlier POST Beep Codes *(continued)*

Beeps	Error Description	Action
4-2-4	Unexpected Interrupt In Protected Mode	Check for a bad expansion card. Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
4-3-1	RAM Address Error >FFFh	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
4-3-3	Interval Timer Channel 2 Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
4-3-4	Real Time Clock Error	Replace the CMOS battery. Replace the motherboard
4-4-1	Serial Port Error	Reset port configuration in BIOS Setup. Disable port.
4-4-2	Parallel Port Error	Reset port configuration in BIOS Setup. Disable port.
4-4-3	Math Coprocessor Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, overtightened screws. Make sure the processor and heatsink are installed properly, remove and reseat. Replace the processor. Replace the motherboard.
1-1-2	System Board Select Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Make sure the processor and heatsink are installed properly, remove and reseat. Replace the processor. Replace the motherboard.
1-1-3	Extended CMOS RAM Error	Replace the CMOS battery. Replace the motherboard.

Phoenix BIOS 6.x and later POST Beep Codes

Newer Phoenix BIOS codes extend the three-beep concatenation by adding yet another beep, for a series of four altogether for most codes. A beep code that reads 1-1-4-1 means that you'll hear one beep, pause, then another beep, another pause, four beeps, another pause, then another single beep. We hope you caught it all on the first runabout.

Beeps	Error Description	Action
1-2-2-3	BIOS ROM Checksum Error	Try reseating the motherboard ROM chip. Try reflashing the motherboard ROM. Replace the motherboard.
1-3-1-1	DRAM Refresh Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
1-3-1-3	8742 Keyboard Controller Error	Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the keyboard. Replace the motherboard. Replace the processor.
1-3-4-1	Memory Address Line Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
1-3-4-3	Memory Low Byte Data Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
1-4-1-1	Memory High Byte Data Error	Clean the memory contacts, reseat the modules. Remove all modules except the first bank. Replace the memory. Replace the power supply. Replace the motherboard.
2-1-2-3	ROM Copyright Error	Try reseating the motherboard ROM chip. Try reflashing the motherboard ROM. Replace the motherboard.
2-2-3-1	Unexpected Interrupts	Check for a bad expansion card. Check for proper motherboard installation, loose screws, foreign objects causing shorts, over-tightened screws. Replace the motherboard.
1-2	Videocard Error	Check the videocard for proper installation. Try replacing the videocard memory. Replace the videocard. Replace the motherboard.

Mention "POST code" to someone in the UK, and he'll think you're referring to the British equivalent of our Zip Codes. There are 124 alphanumeric prefixes for regions within Her Majesty's domain.

Copyrighted material

Indi is a registered trademark of TDK Electronics Corporation. All other brands and products are trademarks of their respective holders.

HAIRY MOVIE

CAPTURE → CREATE → PREMIERE!

0.08.32

iNdiDVD® | TDK®

With a TDK Indi DVD burner and DVD recording media, creating videos and photo slideshows is simple and fun. Add music, narration and sound effects to make your Big Footage a big hit. Quickly create your own Hollywood style DVD, back up data and more. Records DVD and CD discs.

Discover the whole Indi DVD story at www.tdk.com, The Digital Sweetspot™.

Ask the Doctor

Symptom → Diagnosis → Cure

Have a burning PC problem? How about a burning PC sensation? We're more than happy to help you with your PC problems, but you might want to get that sensation thing checked out by a qualified sensation checker-outer. If you have PC questions, send them to **doctor@maximumpc.com**. Just remember: We can't answer every e-mail. Oh, *no*—not by a long shot.

Start Menu's a Mess

What ever happened to the interface for rearranging programs in Windows' Start Menu?

I was trying to put all the Office XP apps into one folder in the Programs menu, but I couldn't figure out how to do it. In Windows 98, I could right-click the Start Menu icon on the Taskbar, hit Open, and move programs or make new folders as I wished. Why won't XP play ball?

—JIM LOGAN

In Windows 98, the contents of your Start Menu's Programs section were stored in a folder in the C:/Windows directory. It's a little more complicated with XP. You see, there are two different types of apps: Those available to each account that can use your PC, and those available to only your account. Even though both types of apps show up in your Programs section, they're actually stored in two separate folders on your hard drive.

For that reason, the easiest way to move stuff in the Programs directory is to actually drag and drop from within the Start Menu itself. To drag things around inside the Start Menu, click the Start button, go to All Programs, then left-click and hold down the mouse button over the shortcut you want to move. Then you can drag the shortcut wherever you want to put it. Unfortunately, this is a tedious process.

If you want to speed things up, you can right-click the Start button, select Explore, then right-click the Start button again and click Explore All Users. You should have two windows open now. The window that opened when you clicked Explore All Users displays the shortcuts that appear for every user of the PC, while the other window shows only the shortcuts that are exclusive to you.

Dragging and dropping directories is the easiest way to reorganize your Start Menu in Windows XP.

You can now drag, drop, and create new folders just like in any other Explorer window. A word to the wise: Leave shortcuts that started in the All Users section in the All Users section, and leave shortcuts that were in your Program menu in your Program menu. If you don't, other users of your computer could experience unpredictable errors, including the inability to run apps that they have shortcuts for.

"To my surprise, what I thought was an off-brand (CenDyne) drive was identified as a LiteOn LTD 163D when I installed it."

How Far Will CAT5 Go?

I need to know the maximum cable length that I can use for CAT5 copper UTP cable.

—DAKSH CHAUHAN

The maximum length for an Ethernet segment using CAT5 cable, such as what's used for 100baseT Ethernet, is 100M, or 328 feet. You can extend that length by using up to two Ethernet Repeaters.

Double-Feature?

I have a homemade movie in AVI format that's about 750MB. How can I split it into two parts, so it can be burned onto a Video CD with *Nero* and played in my DVD player?

—JOSH PERCIVAL

There are two ways you can do this. If you have Windows XP, you can use the built-in *Windows Movie Maker* to split the file into two parts. Go to Start > Programs > Accessories and launch *Windows Movie Maker*. Before opening your file, go to the View menu, select Options, and make sure "Automatically create clips" is unchecked. Drag your file onto the Clip pane. If it's a big file, you might want to take this time to get a refreshment—the wait could be a long one. Once it's opened, click the clip to activate the Preview window, and move the slider that's beneath the image to the point at which you want to edit. Once you've hit the right spot, press Control-Shift-S to split the clip into two parts. Drag the first clip to the timeline at the bottom of the screen, and save the movie as a DV-AVI clip. When that's done, highlight the clip by clicking on it in the timeline and delete it by pressing—yup—the Delete key. Now perform the same operation using the second half of your video.

If you don't have Windows XP, or if the excruciatingly long wait times for large files gets on your nerves, you might want to turn to a faster, but less user-friendly freeware app called *TMPGEnc* (www.tmpgenc.net). Using this handy and effective utility can be a daunting affair, but an explicit tutorial for the program is available at www.vcdhelp.com/ tmpgencedit.htm. (Check out the main page of the web site for explanations and tutorials on tons of other Video CD creation, editing, and conversion utilities.)

DVD Dilemma

I replaced the CD-ROM drive that came with my PC with a new DVD drive. To my surprise, what I thought

Copyrighted material

was an off-brand (CenDyne) drive was identified as a LiteOn LTD 163D when I installed it. That was the good news. But since the installation, the hard drive activity light stays on all the time instead of blinking only when there's activity. Is there anything I should check to see why the light stays on? The computer seems to otherwise work perfectly.

—ROBERT PHILLIPS

Usually weirdness with hard drive and optical drive activity lights is the result of misconfiguration on the IDE chain. The Doctor's not really certain what's causing your problem, but here are a few things you can try.

First, open up your PC and check your IDE cables for nicks and kinks. You may have damaged one of your cables when you installed the new DVD-ROM drive. Next, check the master/slave jumper settings on the back of each drive. Each of your IDE channels—primary (IDE1) and secondary (IDE2)—should have only one device set to master, and one set to slave. Make sure the hard drive you boot from is set to Master on the Primary IDE port.

You didn't say what channel you have your DVD-ROM drive on, but if it's on the primary channel, try switching it to the secondary channel to see if that fixes your problem.

Finally, if you're not seeing a performance hit when accessing either your DVD-ROM drive or hard drive, there's nothing inherently bad about having that one little LED on all the time. If the light bugs you, you can fix it the way Logan fixed the "Check Engine Soon" light in his car—with a small piece of duct tape.

Scumware Sucks

What's the best software for removing pesky spyware and adware from my XP system? I just got through researching *Ad-Aware 5.83* by Lavasoft. It seems like a good product, but it's free, which makes me wonder if I'll be using a program that removes current scumware only to be replaced by this program's more insidious scumware.

—JESSE S.

Spyware, adware, and scumware are apps that hide on your system and perform various nefarious actions without your knowledge. There are a number of different free apps available that promise to rid you of spyware forever, and we've tested several of them. *Ad-Aware* (www.lavasoftusa.com) was the front-runner for a long time, but its definitions (similar to virus definitions used by an antivirus program) haven't been updated in several months. These days we really like *Spybot* (security.kolla.de). It works much like *Ad-Aware*, but also includes the ability to clear the history from many popular apps. And the developers who made *Spybot* update the spyware definitions much more regularly than Lavasoft has lately.

Once it's installed on your system, you'll need to update your definitions. Go to Online, then click Search for Updates. Select all the updates and click Download Updates. Once your updates are installed, click the Spybot-S&D tab, then click Check for Problems. *Spybot* will search your system and list all the potential spyware, as well as any other potentially incriminating info, such as browsing history, and let you back it up or expunge it entirely. Nifty, eh?

If you're worried about *Spybot* or *Ad-Aware* installing spyware of their own, don't be. Both companies have legitimate revenue streams from their products. Lavasoft sells *Ad-Aware Plus*, an enhanced version of *Ad-Aware*, to corporations, and *Spybot* is supported by donations from happy users.

Booting a New Mobo

I have seen this a few times: If you have Windows 2000 on a computer and change just the motherboard, you get the following error message: ***STOP: 0x0000007B (0xF741B84C, 0xC0000034,0x00000000,0x00000000)INACCESSIBLE_BOOT_DEVICE.

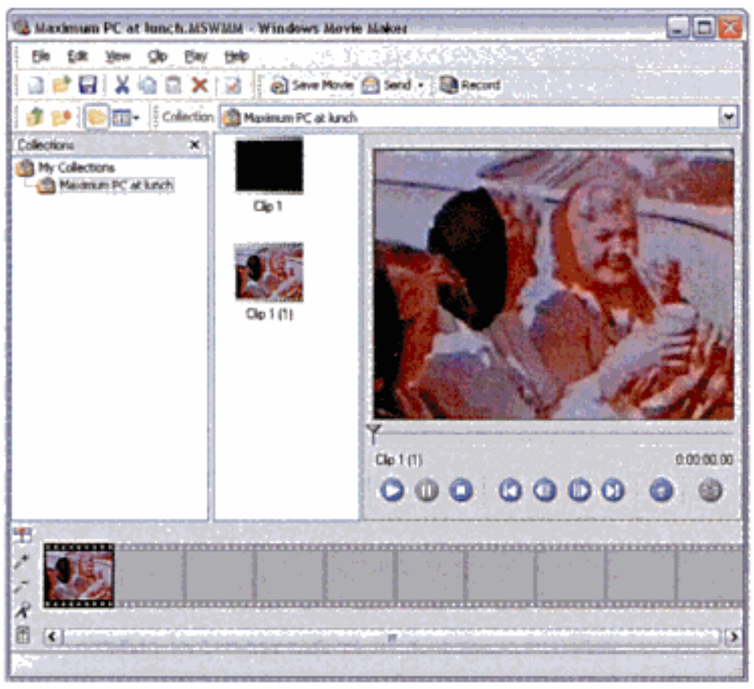
What causes this and how can I get around it?

—JAMES JOHNSTON

This happens to Windows 2000 because the new motherboard has a different hard drive controller than what Windows is looking for. Windows 98 and XP are smart enough to see if there's another driver that will work for the new controller, but 2000 just isn't able to. Unfortunately, there's no easy fix for the problem. If you want to upgrade the mobo in a 2000 machine, your best bet is to reinstall the OS from scratch.

Beer in the Notebook

I have a Compaq Presario 1250 notebook and just recently spilled a beer onto the keyboard. Not the brightest thing to do, I know, but I immediately turned it off and unplugged the AC and battery in an attempt to prevent any damage. I know little about laptops, but figured how hard could it be to clean up in there? So after a little research, I figured out how to open the notebook and get to the keyboard, which I took apart and made sure was completely dry. I got it all back together and turned it on to find everything normal *except* for a 1-pixel-thick red line running vertically down the screen about two inches from the left side.



With *Windows Movie Maker*, we've been able to preserve some of our best moments here at *Maximum PC* in Video CD format.

The other place where the beer could have caused problems is the hinge joint.

I'm pretty sure I didn't do anything to the video or its connection, and I don't think that beer got under the plate beneath the key pad area. So I'd like to know what would cause a single-pixel line across a display, if I could have jarred something (and more importantly can I un-jar it), and do I have a drinking problem? Anyhow, I shut it down and fear these lines may multiply, so please help me, if you can.

—CHRIS MCCOMBER

Nice move, Chris! The Doctor's not sure whether you'll be able to fix your problem, but there are a few things you can try. Try connecting a monitor to your VGA output. If the image on the monitor doesn't have the red line, then your problem lies in the connection between your laptop's onboard videocard and the LCD. Most likely, you knocked one of the fragile ribbon cables loose when you were cleaning beer out of the keyboard. Take the laptop apart and check for loose connections.

The other place where the beer could have caused problems is the hinge joint. Laptop hinges do double duty. Not only do they let you open and close your PC, but they also carry the video signal from the PC to the LCD monitor. If you got beer into the

Copyrighted material

hinge, you'll probably need to take the laptop to an authorized service center for repair. The hinge is fragile and not user serviceable. We don't even fool with them at *Maximum PC*.

If you connected the laptop to a normal monitor and the red line persisted, beer seeped past the keyboard and into the innards of the laptop. And if that's the case and your only problem is a thin red line of pixels, consider yourself lucky. Regardless, we recommend backing up any important data from that machine.

Messenger Messages Are Driving Me Mad

I have a home LAN using WinXP Home Edition. My family and I will be playing online games or watching a movie in the living room when all of a sudden we get a pop-up message on our Desktop. These messages range from software ads to pornography to ads for a product to prevent these pop-ups! This sounds like extortion, doesn't it? My family

"These messages range from software ads to pornography to ads for a product to prevent these pop-ups!"

and I play a lot of online games, and I've heard that some software firewalls can interfere with the ability to play. Can I fix this problem without resorting to third-party software?

—JEFF WORTHEN

The Windows Messenger service—not to be confused with Windows Messenger, the IM client—is the latest front in the war against spam. Luckily, it's much easier to get rid of Messenger spam than it is to nix e-mail spam.

All you need to do is open up the Properties for your Internet connection, go to Start, Control Panel, Network Connections, and then right-click the icon for your Internet connection. (If you use a cable modem or DSL, it will probably be a Local Area Connection, but if you use an analog modem it will be named after your ISP.) Click Properties, then click the Advanced tab. Check the box labeled "Protect my computer and network by limiting or preventing access to this computer from the Internet." If you're using Internet Connection Sharing to give the other users on your LAN access to the Internet, you'll only need to enable the firewall on the PC that's connected to the net. If each of your PCs has a separate address assigned by the ISP, you'll need to enable the firewall for each of your PCs. Regardless, after the firewall is on, the Messenger messages should cease.

The built-in firewall shouldn't affect gaming, and hasn't in our experience. As far as we can tell, it only blocks Windows networking requests and messages from the net.

Going Dual

I'm getting ready to build my "Dream Machine" and have been keeping an updated list of all the new features and components on the market to ensure that my new system has the latest and greatest parts. Since the arrival of the 3.06GHz Pentium 4 processor, I've seen motherboards chock-full of features from Serial ATA to 8x AGP and to every other possible goodie that you could possibly want. My wish list includes everything from RAID to USB 2.0. However, what I'm *really* looking for is a board that will let me run dual Pentium 4 processors at 3.06GHz with Hyper-Threading enabled and all the other overclocking super-stellar features that a dream system needs. The problem is that I cannot seem to find anything that meets my criteria. Am I just too early for my dream mobo or am I not searching hard enough?

—TIM WENGER

Unfortunately you're out of luck for the time being. Since the move to the Pentium 4, Intel has not offered dual processors for its desktop CPUs as they once did back in the Pentium, Pentium II, and Pentium III days. If you want dual Pentium 4s, you'll have to consider moving to the Xeon platform, which is designed for entry-level server and workstation chores.

Dual-Xeon motherboards are generally very expensive compared with single-proc boards and generally don't have the whizbang features of the latter, although the Intel E7505 chipset does support AGP 8x, dual-channel DDR, a 533MHz frontside bus, and USB 2.0. The Doctor has heard from some motherboard vendors that plan to offer dual-Xeon motherboards in the $250 to $300 range, but it's not likely to get any cheaper than that. Most workstation motherboards are also designed for stability and thus features such as overclocking are left out.

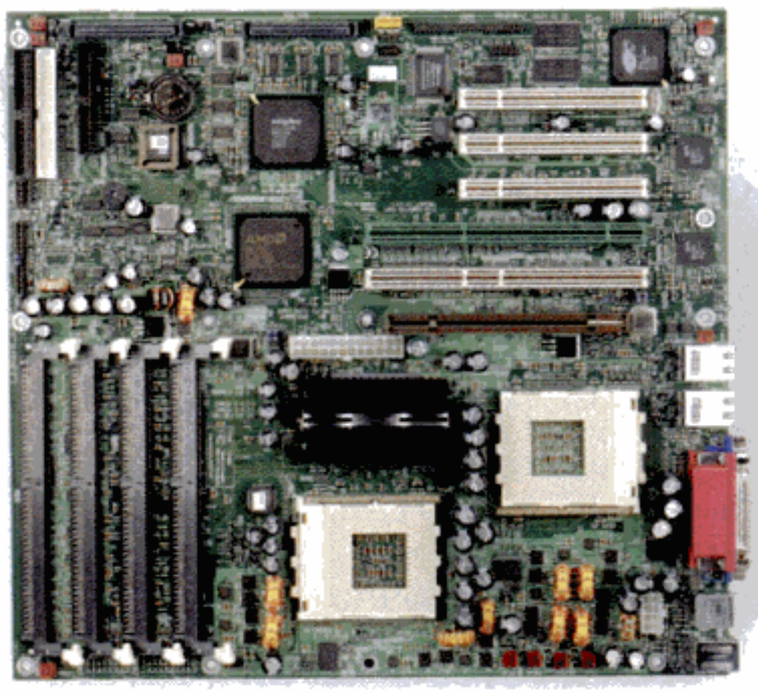
Do I Really, Really, Really Need to Have a Swap File?

I run Windows XP Home edition. I have 1GB of RAM and have disabled my swap file. I see that a lot of systems come with 512MB of RAM, so I think my system likes having 512MB of memory and a 512MB swap file (only I use real RAM for my swap file).

Is the actual swap file needed? I have noticed that even with 1GB of RAM, the system was still accessing the swap file occasionally. I got rid of it a while back and have not seen any performance issues.

Is there any down side to getting rid of the swap file?

—HOWARD MONETA



There are no dual-Pentium 4 boards, but a dual-Xeon board will give you double the power, without some of the fancy features common in normal desktop boards.

Well, there's not really any performance- related reason to have a swap file, but the swap file does serve an important purpose: increased stability. If you run a piece of software with a nasty memory leak that eats up all your RAM, and you don't have a swap file, as soon as the errant program fills your RAM, your machine will crash.

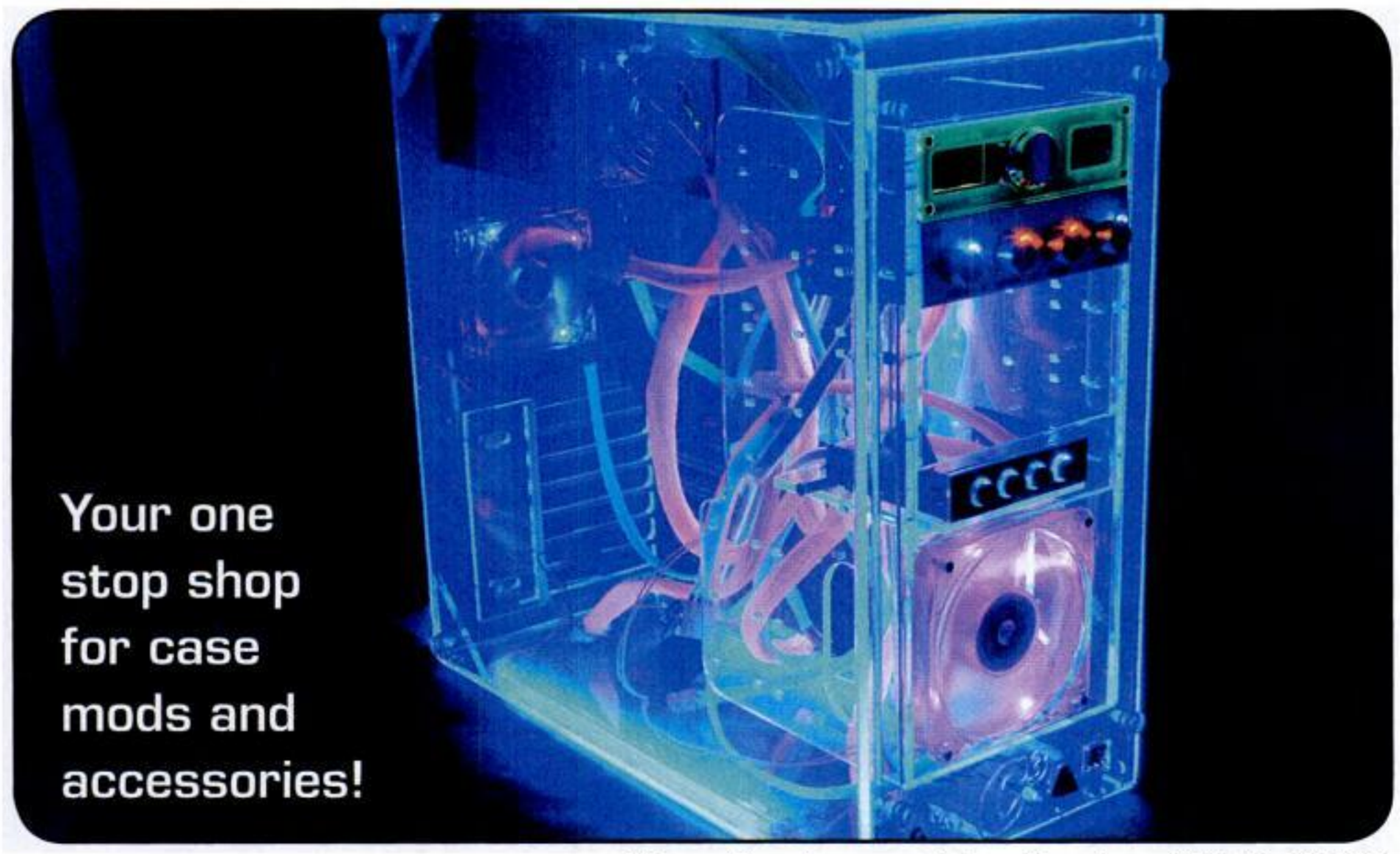
If you had a swap file, the machine would just begin to slow down and your hard drive would start to churn. The slowdown would let a savvy user, like any regular Doctor reader, know that there's a problem with his PC, so he could begin the troubleshooting process.

Of course if you don't have a swap file, you'd just be sitting at your desk wondering why your machine crashed out of the blue. ■

Copyrighted material

www.svc.com

cool products.
hot prices.



UV sensitive clear case pictured here is available for $219.99.

X-Pider Aluminum Case

$124.99

Includes four tri-LED Fans and an acclaimed 420W Turbo-Link Power Supply. One of the best cases you can buy. SVC also carries the older Chenming Aluminum Dragon Cases in four colors for $109.99 with a 420W PSU.

Laser Cut Fan Grilles

$1.99

These new finger guards have become a very popular dress-up item in case-modding circles. Our competitors feature the same grilles in other ads for $17.00! SVC has the three most popular designs with more to come.

12" Neon Light Kit

$12.99 and up

Available in 12 colors! This CCFL Neon Light Kit includes an inverter/balast that supports two tubes. Additional tubes available in all 12 colors starting at $4.99. Output from a 620V 3mm tube is 29,000 Cd/m^2, the best and brightest on the market. Add a sound activated module for $6.99.

Round Drive Cables

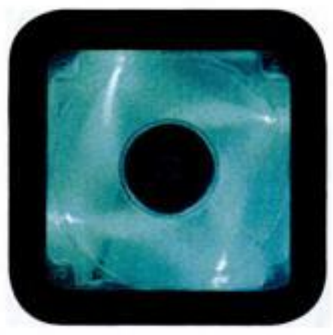
$1.75 and up

Over 100 different cables including UV sensitive, braided silver, braided copper, translucent, and grounded sleeve with gold plating. Floppy cables start at $1.75. ATA-133 Cables from $2.99. 68-pin SCSI LVD/SE 50 inch four device cable from $9.99! Largest selection at the lowest prices, guaranteed.

Techflex Expandable Sleeving

$1.99 for 5 ft.

Tired of all those loose wires coming out of your power supply or on the back of your computer? Our expandable sleeving gives you a clean solution both inside and outside your computer. Over 80 sizes and colors including UV sensitive neon colors for the lowest prices around.



Quad LED Fans

$2.99 and up

These ball bearing fans feature four bright LEDs in a clear housing. SVC has them in 80mm, 92mm, and 120mm sizes. Even the expensive dual ball bearing 120mm fans are only $6.99. Check our website for color selections. Also available with mixed color LEDs.

Visit out website at http://www.svc.com to see hundreds of other cooling products, case mods, and other accessories to customize your computer.

Fans and Fan Accessories

80x25 Blue UV Sensitive Fan	$4.99
Clear Blue 80mm to 60mm Fan Adapter	$1.99
80mm Chrome Finger Guard	$0.60
3-pin to 3-pin extension	$0.99
3-pin to 4-pin adapter with separate RPM connector	$0.99

YS-Tech

60x25 40CFM Ball Bearing Fan	$2.99
80x25 Variable Speed Fan (10-48 CFM)	$8.99
92x25 66.3 CFM Ball Bearing Fan	$7.99
120x25 105CFM Ball Bearing Fan	$13.99
120x38 125CFM Ball Bearing Fan	$13.99

Sunon

80x25 39CFM Ball Bearing Fan	$7.49
80x25 50CFM Ball Bearing Fan	$8.99
Vantec Nexus Multi-Function Panel	$36.99
4-pin Molex Power Y-Adapter	$0.50

Arctic Cooling, Switzerland (SVC exclusive)

Super Silent Pro TC	$14.99
Super Silent 4TC	$14.99
TC-1 80mm Case Fan	$5.99

Heatsinks/CPU Coolers

DDR Heatspreader and Ramsinks	$4.99
Swiftech MCX462-U Socket Heatsink	$44.99
SVC GC68 80mm Socket A Cooler	$4.99
Arctic Silver III 3.0g Syringe	$4.99

Thermalright

SLK-800	$29.99
SK-7	$19.99
SK-6+	$9.99
Aquarius II Liquid Cooling Kit	$139.99
Volcano 9 with Coolmod	$23.99
G4 Cooler with Coolmod	$17.99
Active DDR Memory Cooler	$9.99

Zalman

CNPS6000Cu Noiseless Cooler	$29.99
Heatpipe Fanless VGA Cooler	$29.99

ATX Cases

Clear Acrylic Case (unassembled)	$99.99
AMS G-Mono "Car Paint" ATX Case with Window (3 colors)	$59.99

ATX Power Supplies

L&C 350W P4	$19.99
Thermaltake 420W P4 Purepower	$52.99
Vantec 520W Stealth P4	$129.99
Zalman 300W "Noiseless" P4	$69.99

Miscellaneous

Tool-less Thumb Screws	as low as $0.10
Anodized Alum. Thumbscrews (Qty. 4)	$1.49
PS/2 Multimedia Keyboard	$6.99
Akasa PAX Mate Sound Dampening Material	$10.99
MM Gear True Surround Sound Headphones	$69.99
Cat5 Cable Set (6 ft, straight & xover)	$0.99
Laptop Carrying Case	$14.99
Serial ATA - Parallel to Serial Adapter	$24.99

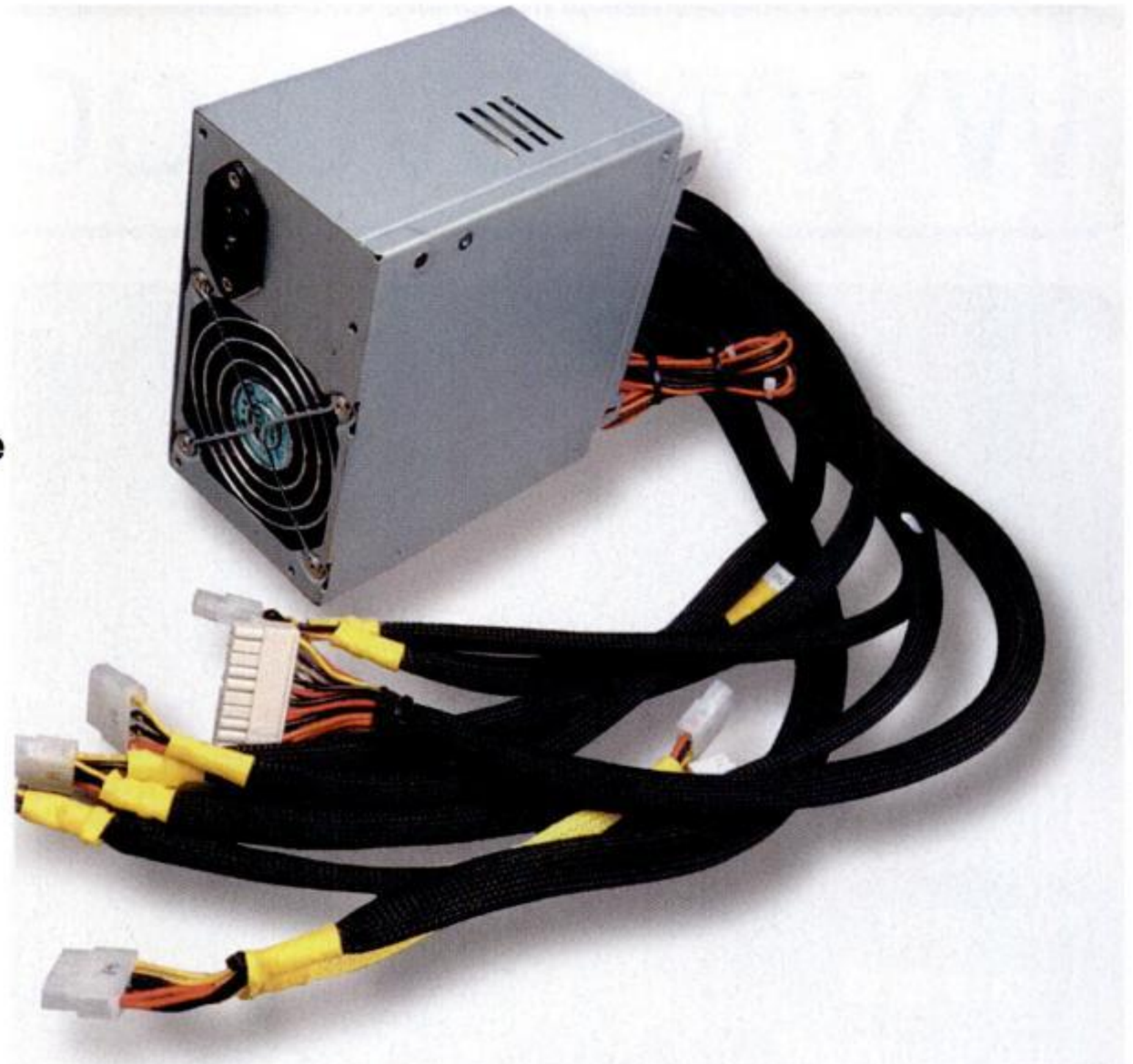
SVC

Silicon Valley Compucycle, 876 The Aladema, San Jose, CA 95126
telephone > 408 292 SVC2 fax > 408 292 5295 web > http://www.svc.com

Copyrighted material

How To...

A step-by-step guide to tweaking your PC Experience



RIG YOUR POWER SUPPLY

DREAM MACHINE-STYLE

MAXIMUMPC
TIME TO COMPLETION
01:34
HOURS MINUTES

Ever since we unveiled Dream Machine 2002 last September, readers have hammered our mailboxes with requests for a how-to that explains the creation of the Dream Machine's power cables. Here it is—your wish fulfilled. But before we get started, there are a few things you need to know:

➤ If you do not put the wires back *exactly the way they were*, the power supply will probably catch fire. That's a very bad thing.

➤ If you follow our directions exactly, your system will continue to work perfectly. If you don't, and your PC gets hosed, don't complain to us. We warned you.

➤ If you didn't pay for your PC, don't try this without getting the owner's permission. Ask your mom, dad, and/or wife.

The more hardcore materials used in this primer can be found at electronics stores and Wirecare.com.

—TOM MCNAMARA

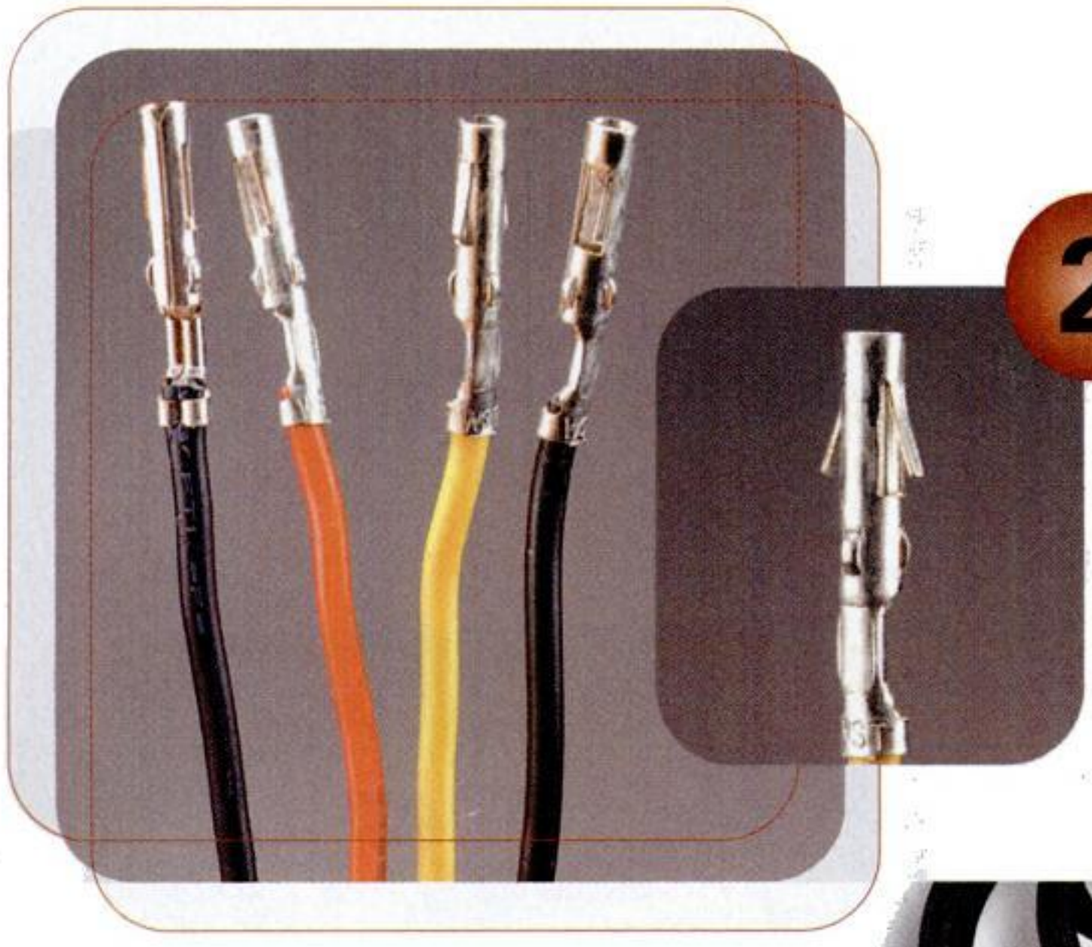
Ingredients

- **Half-inch heat-shrink tubing: $3.50**
- **Quarter-inch expandable tubing: $5**
- **Three-eighths-inch expandable tubing: $6.50**
- **Half-inch expandable tubing (for mobo power cable): $8**
- **Hot knife: $15–$25**
- **Heat gun: $15–$25**
- **Thumbtack or needle: one cent**
- **Good pair of scissors: priceless**

1 Extracting the Power Supply (PSU)

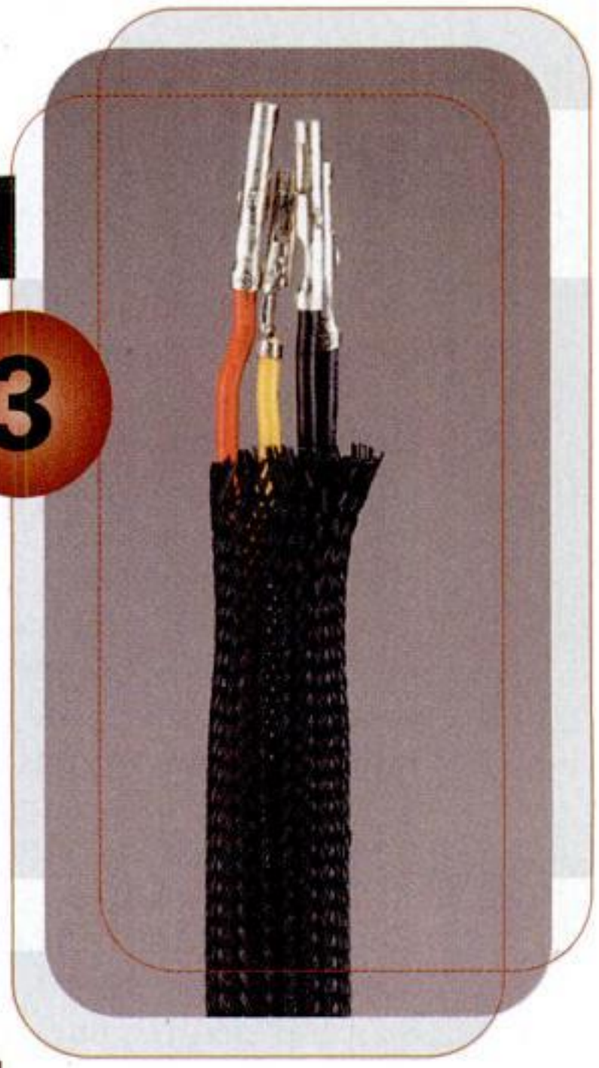
First, unplug your rig. Then press the power button on the front of your box to discharge any remaining juice. Next, remove the PSU, taking care not to confuse the screws that fasten the PSU to the case (circled in red) with the screws holding the PSU together.

Copyrighted material



2 Preparing Your Connectors

Next you need to remove the white plastic Molex connectors from each of the wires coming from the power supply. The wires have small tabs that must be pushed in to be released from the Molex. This can be done with a thumbtack, needle, or very small jeweler's screwdriver. A magnifying glass helps here, but we were able to make do without one.



Inserting the Tubing 3

We recommend covering eight-wire sections of cable with three-eighths-inch expandable tubing for the best fit, and four-wire sections with quarter-inch tubing. Line up the expandable tubing next to each section, and then take measurements. Leave at least half an inch of wire exposed at either end. We recommend using a hot knife to cut the tubing; this prevents ends from fraying.

4 Securing the Tubing

Cut a one-inch piece of heat-shrink tubing and slide it along the cable until it's covering the end of the expandable tubing. Make sure you leave enough room to easily attach the Molex connectors. Use a heat gun to shrink the tubing until it's snug. If the heat-shrink tubing begins to smoke, turn off the gun.

Reattaching the Connectors 5

Re-insert the wires after pushing the little tabs back out to their original positions. Remember, you *absolutely must* put the wires back in the exact orientation as when they came out, or else you could cause permanent damage to your PSU and/or your computer. Because the mobo power connector is so complex, you're better off just bending it enough to slip a larger piece of tubing past it, rather than detaching it and dealing with disconnecting and reconnecting all those wires. ■

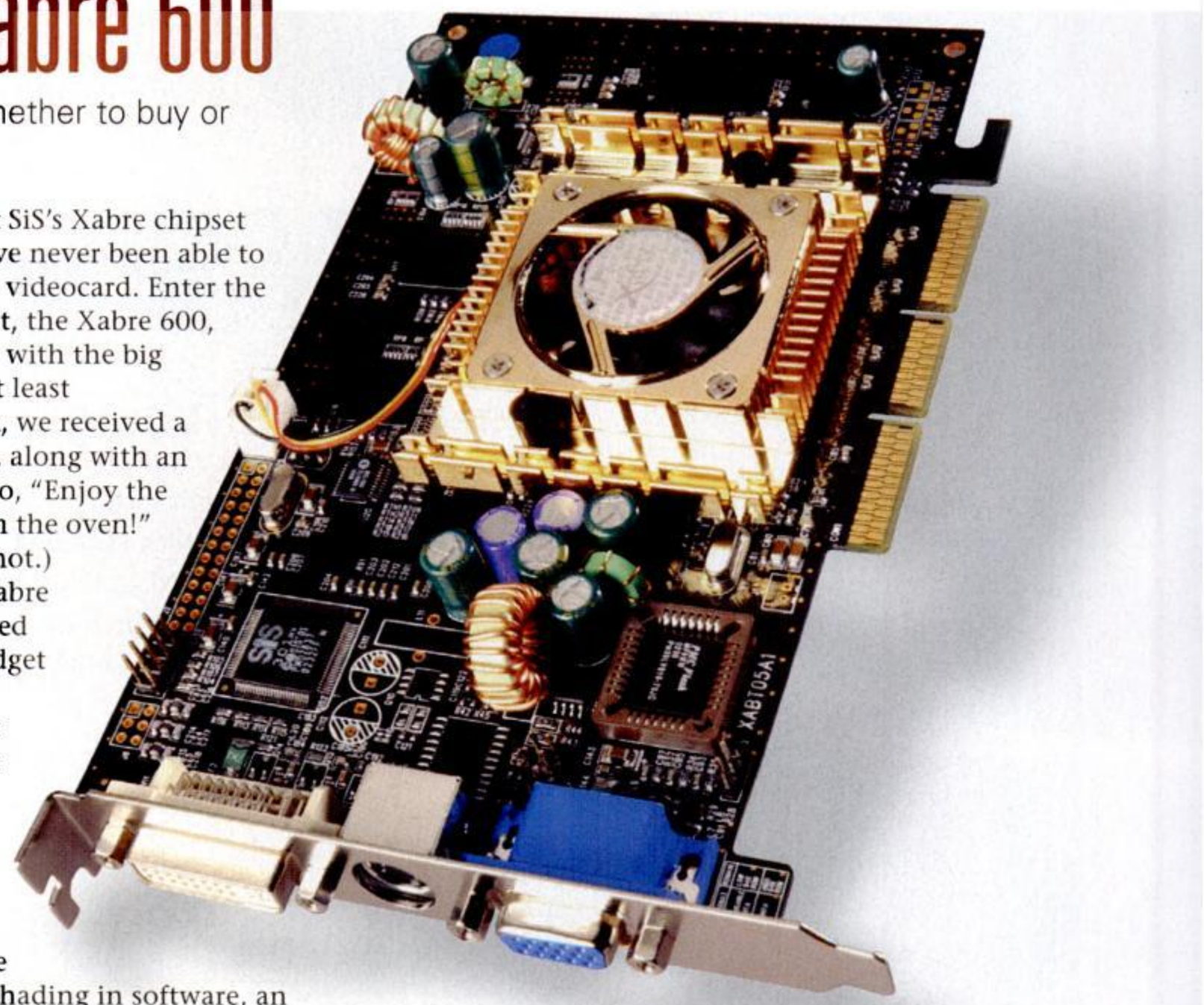
Copyrighted material

In the Lab

A behind-the-scenes look at Maximum PC testing

Introducing the Xabre 600

A budget card from SiS? We tell you whether to buy or beware!



The Xabre 600 budget videocard is SiS's first fast offering. Should nVidia and ATI be nervous?

We first heard about SiS's Xabre chipset last April, but we've never been able to score a reviewable videocard. Enter the latest version of the chipset, the Xabre 600, which can finally compete with the big guns of ATI and nVidia—at least according to SiS. Last week, we received a Xabre 600 reference board, along with an attached note inviting us to, "Enjoy the fresh-made Xabre 600 from the oven!" (Direct quote, we kid you not.)

On the tech side, the Xabre 600 is pretty beefy compared with other cards in the budget range. The chipset runs a 315MHz core with support for up to 128MB of 128-bit DDR memory, also clocked at 315MHz. The Xabre includes DirectX 8.1 pixel shaders, but oddly doesn't include vertex shaders. Instead, the Xabre implements vertex shading in software, an approach that will leave the Xabre crawling in games that require vertex shaders. Upon installation, we were disappointed to find that there were no control panel options for enabling anti-aliasing—quite odd for a reference board, don't you think? Suffice it to say, we weren't able to run our standard AA-enabled benchmarks.

Regardless, the Xabre 600 performed surprisingly well, given its budget heritage. Its performance was just a tad slower than that of the nVidia GeForce Ti 4200 in most benchmarks (though it of course lagged far behind the 4200 in *3DMark2001's* programmable shader test, Game 4, due to its lack of vertex shader support). SiS says it plans to introduce Xabre II, a full-featured Vertex Shader 2.0 and Pixel Shader 2.0 part, this year.

THE SPECS

Process:	0.13-micron
Memory amount:	128MB
Memory type:	128-bit DDR SDRAM
Memory speed:	315MHz
Core speed:	315MHz
AGP speed:	8x

To test the Xabre's software compatibility, we loaded up just about every game we could find, including *Quake3, EverQuest, Bridge Commander, Return to Castle Wolfenstein,* and *SimCity 4*. We saw no problems whatsoever, which is rare even for nVidia and ATI boards. No weird visual anomalies, nothing. Of course, the Xabre drivers have had almost a year to mature since the launch of the Xabre 200 and 400.

Our only real complaint about this board is its poor 2D rendering. At resolutions greater than 1280x1024, desktop objects shimmered, making it difficult to read text. This is similar to the low-pass filter problem that many of the cheaper nVidia boards have exhibited.

The Xabre 600 is definitely superior to the pixel shader–less GeForce4 MX series from nVidia, but we can't see buying one of these cards over a GeForce4 Ti 4200 or Radeon 9000, which cost the same price. Both the ATI and nVidia cards include pixel and vertex shader support, and churn out better benchmark scores across the board. They also have full support for anti-aliasing and anisotropic filtering, and should run *DOOM III* (albeit slowly).

THE BENCHMARKS	SiS Xabre 600		
3DMark 2001:SE Game 2	**3DMark 2001:SE Game 4**	**Q3: MaxPC Demo**	**UT2003: 1600 x 1200**
62.7	16.3	94.6	18.9

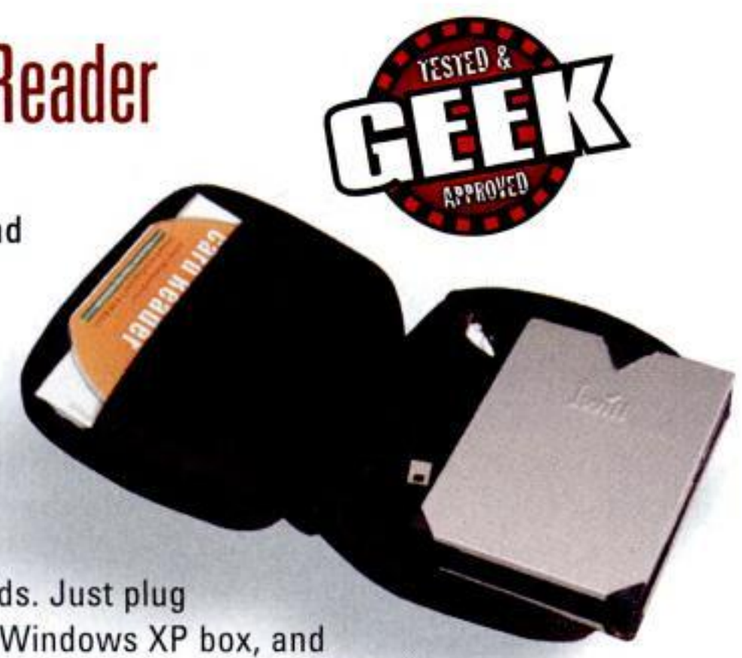
All tests were run at 1280x1024 unless otherwise noted. Benchmarks were run on our 3D zero-point test machine: a 2GHz Pentium 4, with 1GB of PC800 RAM on an Intel 850 chipset.

Copyrighted material

Test Your RAM for Free!

We normally rely on Ultra-X.com's RAM Stress Test to gauge memory problems that crop up from bad memory modules, a bad DIMM socket, or overly aggressive memory timings. But what if you can't pony up the ducats for a RAM tester? *MemTest86* is a free software-based memory tester that gives you pretty good performance especially when you factor in its price. Simply download the ISO from **www.memtest86.com** to burn a bootable CD-ROM. The CD-ROM is independent of the OS (it's actually based on GNU Linux) but does a fine job of gauging memory problems. The new 3.0 version tests beyond 2GB of RAM and adds more core-logic chipset support.

Iwill CR611 Card Reader



When you're in a pinch to read data from a memory card, don't call 911, try the CR611. Iwill's mini card-reader is a tiny but complete package, and reads Compact Flash, Microdrive, Memory Stick, Smart Media, Secure Digital, and MMC cards. Just plug the short USB cable into any Windows XP box, and you're ready to go. Even more clever, Iwill puts a "business-card CD-R" into the case should you ever need to install the CR611 on an OS that doesn't natively support it. The entire $29 package fits into a leather case that has slots for your media. Go to **www.iwillusa.com** for details.

Best of the Best

As of March, 2003

Here are our current top picks for each hardware category. Red text indicates first month on chart. Check back next month for updates.

High-end videocard:
Hercules 3D Prophet 9700 Pro

Budget videocard:
Gainward GeForce4 Powerpack! Ultra/650XP Golden Sample (GeForce Ti 4200)

Do-everything videocard:
All-in-Wonder 9700 Pro

Soundcard:
Sound Blaster Audigy 2 Platinum

Hard drive:
IBM Deskstar 180GXP

CD-RW drive:
Plextor PXW4824TA/BPS

DVD burner:
Sony DRU-500A

LCD monitor:
Sharp LL-1820

CRT monitor:
Sony F520

P4 motherboard:
Asus P4T533-C

Athlon XP motherboard:
Asus A7N8X

Portable MP3 player:
iPod 20GB

Photo printer:
Epson Stylus Photo 1280

Pocket PC PDA:
Toshiba e740

5.1 speakers:
Logitech Z-680

4.1 speakers:
Logitech Z-560

2.1 speakers:
Klipsch Promedia 2.1

Our current gaming favorites: *Battlefield 1942, SimCity 4, Medieval Total War*

Reader Man Goes Hollywood!

It was inevitable: Reader Man's photos in *Maximum PC* (Dec. 2002) caught the eye of Hollywood talent scouts. High-powered lunches at Campanile were followed by script treatments, and suddenly Reader Man was splitting his time between the Maximum PC Lab and the soundstages at Miramax. We were lucky enough to get our hands on some publicity stills from three of Reader Man's upcoming projects.

In an attempt to woo more PC users to game consoles, Konami casts Reader Man in *Metal Gear Solid XP*. Reader Man works as Solid Snake's hi-tech assistant, bailing him out of tight spots when Snake's CMOS gets wiped.

Seen on the set of *Tomb Raider 5*, Reader Man stars as Lara Croft's husband. An IT manager at a Sil-Val start-up company, Reader Man is oblivious to the shenanigans his wife faces on the job.

When the studio failed to re-sign Michelle Yeoh, Reader Man landed the role of Chow-Yun Fat's sidekick in *Crouching Tiger, Hidden Partition*. This prequel chronicles how Li Mu Bai first obtains his Green Destiny sword at a local computer swap meet.

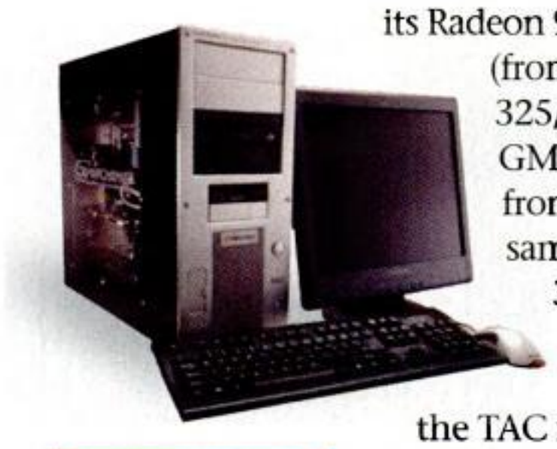
Copyrighted material

GMachines Omega

Superfast, if not a bit too ambitious

Despite being packed with parts, the Omega's interior remains tidy.

When we receive a rig with both an overclocked CPU and an overclocked videocard, we know the system vendor wants to make a bold performance statement. Last month, the showoff was Totally Awesome Computers, which boosted its 3GHz Pentium 4 to 3.13GHz, and its Radeon 9700 Pro to 325/320MHz (from a default of 325/310MHz). This month, GMachines one-ups the boys from Utah by clocking the very same parts to 3.22GHz and 345/345MHz, respectively.



Why, then, did the GMachines Omega trail the TAC rig by five points in *SYSmark2002?* We think it has something to do with the Omega's hard drive array. Four 80GB Western Digitals running in RAID 0 sounds nice on paper, but we suspect that the system suffered some parasitic performance loss: The parallel ATA hard drives plug into the mobo's Serial ATA connector via a 3Ware PCI card that doubles as both a RAID controller and parallel-to-SATA adapter. The Omega was faster in all other tests, however—albeit with a hiccup in *3DMark2001* Game 4.

The Sapphire-branded Radeon 9700 Pro couldn't complete Game 4 in its overclocked state, but it did hit a blistering 72fps when we reset the videocard frequencies to stock speeds (for comparison's sake, the TAC rig hit 69.5fps with its OC'd card). However, when we tossed *Jedi Outcast* and *UT2003* at the Omega, it performed rock-solid, even with its videocard clocked up to 345/345.

A peek through the acrylic side window of the Cooler Master case reveals a 120mm heatsink fan strapped onto a copper Zalman. The case is all-aluminum and the side window is etched with the company logo. A blue cathode light reveals shiny cables and a relatively clean space, considering how much stuff has been packed in there. The two front-mounted 80mm fans are on the noisy side, but the four 7200rpm drives would probably go up in smoke without them.

The Omega's software package was a little bare-bones for our liking. You'll get some standard games, DVD software, and not much else. But the software binder does include an image of the original system installation on two CDs, plus the installation CDs for the Audigy2 and the ASUS P4T533 motherboard. Even better, you get WinXP Professional Edition on an official CD, rather than some cheesy recovery CD, which is the preferred offering of many OEMs.

With the Omega, you get what you pay for—in terms of performance. But without a full gig of memory, a DVD burner, and snazzier speakers, the rig feels strangely stark. For a price tag in excess of $4,500, we expect these features (especially the RAM). We also would have preferred two 160GB drives, with plenty of space between them.

The four 80GB drives draw a lot of juice, take up a lot of space, create a lot of heat, and demand noisy fans. And while Serial ATA precludes the cable clutter of four hard drives, we think SATA isn't mature enough—its theoretical performance gains just don't show during real-world use (and the use of a parallel-to-serial adapter may not help either). Nevertheless, the Omega is still fast as lightning and cool looking.

—TOM MCNAMARA

UNDER THE HOOD

THE BRAINS	
CPU	3.22GHz P4
Mobo	ASUS P4T533 i850e
RAM	512MB RDRAM PC1200
I/O ports	Five USB, one FireWire, PS/2 mouse, PS/2 keyboard, serial ports, mic input, VGA, DVI, S-video
LAN	Netgear FA-311 10/100
DISPLAY	
Videocard	Sapphire Radeon 9700 Pro
LCD	17-inch Hitachi CML174B
STORAGE	
Hard drives	Four 80GB Western Digital SEs WD800JB
RAID	3Ware Escalade 8500-4 SATA/150
DVD-ROM	Samsung 16x (48x CD-ROM reads)
CD-RW	LiteOn 52/24/52
SOUND	
Soundcard	SoundBlaster Audigy 2
Speakers	EV SonicXS 4.1
FINE DETAILS	
Case	Cooler Master ATC-201 B-SXT
Fans/extras	430-watt Antec TruPower power supply, Zalman CNPS6500B-CU heatsink, 120mm heatsink fan, three 80mm case fans, blue cathode light
Mouse	Microsoft IntelliMouse Optical 1.1 Special Edition USB
Keyboard	Belkin Classic Keyboard F8E206 107-key PS/2
BUNDLE	
Soldier of Fortune 2, Hitman 2, PowerDVD XP	
BOOT: 41 sec.	**DOWN: 70 sec.**

MAXIMUMPC VERDICT

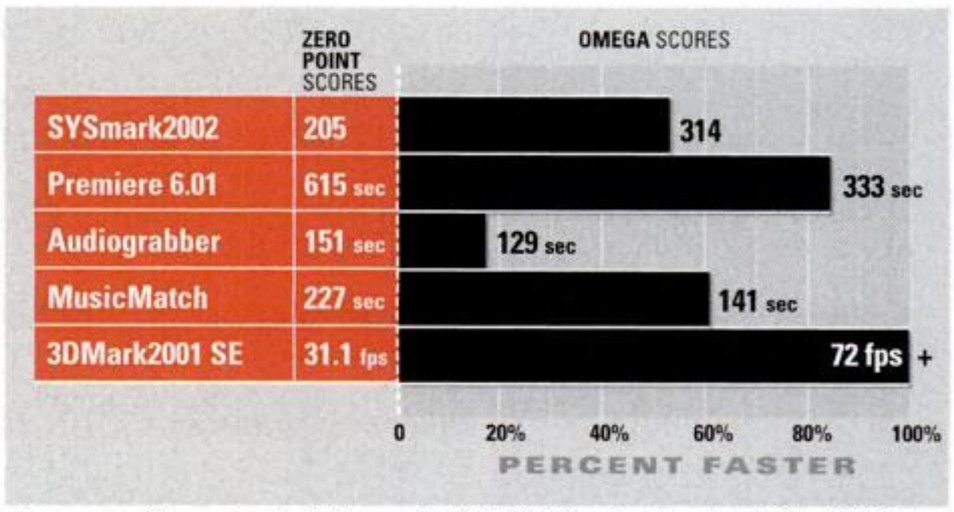
Omega
GMACHINES

+ GREAT PYRAMID OF GIZA
Fast enough to tear a hole in the space-time continuum.

− TOWER OF BABEL
Missing some bells and whistles. Dubious RAID array. Suffered a benchmarking glitch.

www.gmachines.com
$4,550 ($3,570 w/out speakers, LCD monitor)

8



Our zero-point system includes: an Intel D850MV motherboard, a 2GHz P4 CPU, 512MB PC800 RDRAM, a GeForce4 Ti 4600 videocard, and a Western Digital 1000BB hard drive (2MB cache).

Copyrighted material

Sleekline 2800R

One fast pizza box

Let's LAN party: The whole shebang fits into a Cold War–era rolling case for easy transport.

When we first reviewed PC Power and Cooling's Sleekline a year ago, it was an underwhelming machine. Relying on grandma-quality integrated graphics and audio, the machine was one big yawner.

Well, no longer. PC Power and Cooling's Sleekline has come back with an attitude. Using nearly the same "pizza box" dimensions of the first rev, the guys from PC Power and Cooling managed to jam a Radeon 9700 Pro and 2.8GHz P4 into a PC that's just a little less than 1.75-inches tall.

To get temps within tolerance, PC Power and Cooling said it carefully modeled the airflow. An extra plate sits on top of the PC to aid in air induction. Cool external air is directly vented past the videocard and hard drive, and sucked out of the case by three 40mm fans. Another cutout above the CPU lets the P4 suck cool air in, as well. The result is a system that runs fairly cool and quiet even during heavy use.

The original Sleekline catered to the business and small footprint crowd. This new model is obviously aimed at gamers who want something portable for LAN parties yet still much more powerful than any notebook. Though notebooks are pushing CPU speeds of 2.8GHz and 3GHz, they still fall far short of desktops in terms of performance because of their slow, 5400rpm hard drives. Also, while notebooks now sport programmable-shader videocards, their graphics aren't as fast as their desktop counterparts because of power and heat limitations. Enter the Sleekline 2800R, which is able to run the ATI Radeon 9700 Pro at full speeds. Dig: Its score in *3DMark2001 SE* Game 4 is more than twice that of the fastest notebooks we've seen!

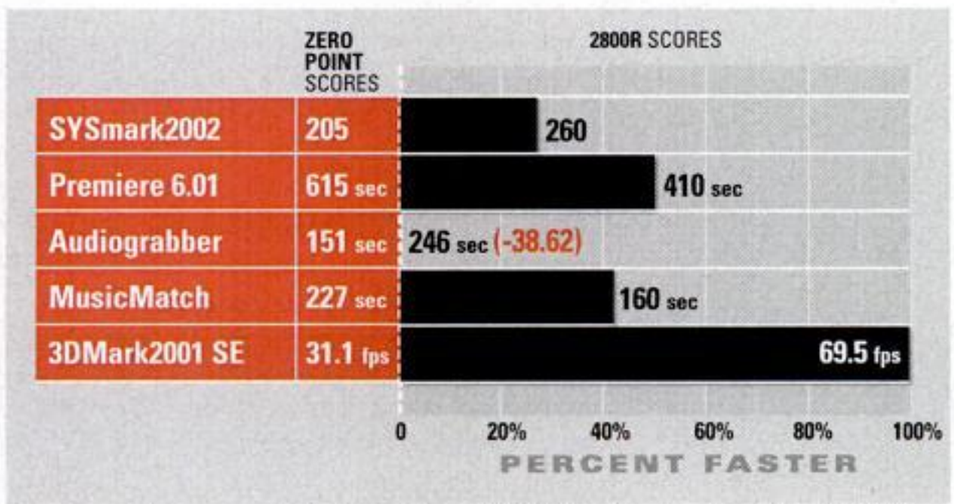
Other amenities in the 2800R include a full-blown 2.8GHz P4 that PC Power and Cooling says will never need to throttle down due to heat demands, 512MB of DDR333 in an 845G motherboard, USB 2.0, 10/100 Ethernet, a combo drive (24x CD-R, 12x CD-RW, 24x CD read, and 8x DVD read) and a 250-watt power supply. Also nice is a Sony SDM-V72W flat-panel that's 17.1-inches diagonal and features a wide-aspect ratio and great contrast specs.

So how does the thin mint stack up against desktop behemoths? Well, last November, a 2.8GHz/DDR desktop machine with RAID scored 256 in *SYSmark2002*. The Sleekline, with its single drive, was actually a bit faster at 260. That said, the 2800R doesn't hold a flame to the 3GHz RDRAM boxes we've seen lately (both the GMachine in this issue and the Totally Awesome PC in last month's issue broke 300 in *SYSmark2002*). We couldn't run the GMachine with its card overclocked (see page 60), but at stock speeds it turned in 69fps in *3DMark2001 SE,* which was the same as the 2800R. Not bad considering the 400MHz difference in CPU clock speeds.

The nicest part of the 2800R is its packaging. The entire system—including a 17-inch flat panel and keyboard—stuffs into a rugged rolling case (it's essentially a piece of luggage). The stiffest competition the 2800R will face is from machines based on Shuttle's XPC bare-bones case platform. Both formfactors are difficult to upgrade and wrench on, but for the most part, they're not designed as tinkering boxes, but rather as portable gaming boxes.

Because of its limited upgrading options, the 2800R isn't for everyone, but it's an eye catcher, for sure, that will truly stand out at any LAN party.

— GORDON MAH UNG



Our zero-point system includes: an Intel D850MV motherboard, a 2GHz P4 CPU, 512MB PC800 RDRAM, a GeForce4 Ti 4600 videocard, and a Western Digital 1000BB hard drive (2MB cache).

MAXIMUMPC VERDICT

Sleekline 2800R
PC POWER AND COOLING

BLONDIE'S
A nifty rolling case lets you check in and out of LAN parties in a hurry.

DOMINO'S
Limited upgrade options will hurt tweakers down road.

www.pcpowerandcooling.com
$3,900 ($2,400 w/o case and monitor)

9

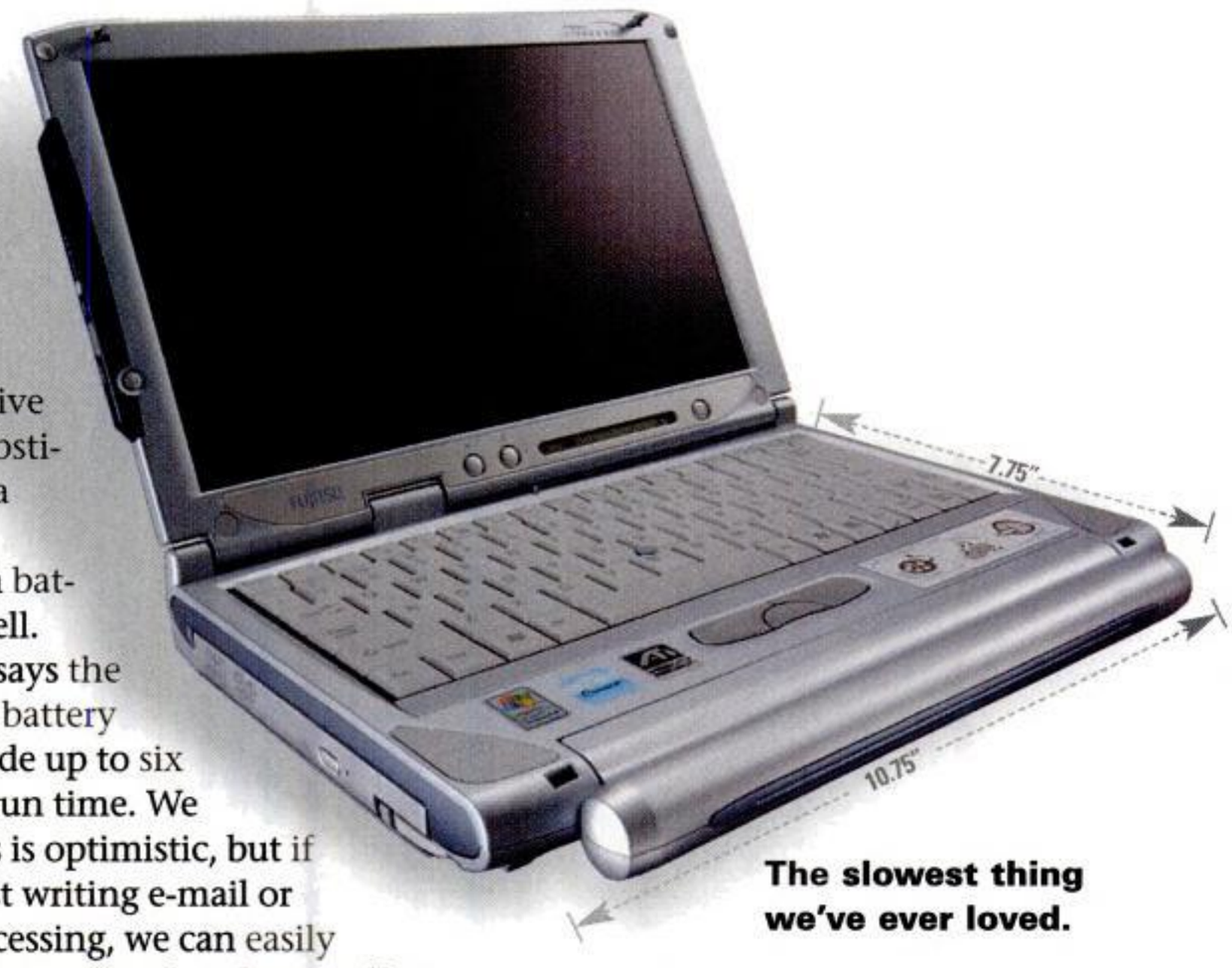
UNDER THE HOOD

THE BRAINS	
CPU	2.8GHz Pentium 4
Mobo	AOpen Micro ATX using Intel 845G
RAM	512MB RDRAM PC2700
I/O ports	Four USB 2.0, Fast Ethernet, PS/2 mouse, PS/2 keyboard, serial, game port, parallel port, mic in, audio in, audio out, DVI, VGA out
LAN	RealTek RTL8139
DISPLAY	
Videocard	ATI Radeon 9700 Pro
LCD	17-inch Sony SDM-V72W (17-inch viewable 16:9 ratio)
STORAGE	
Hard drive	120GB IBM 120GXP Deskstar
CD-RW/DVD	LSC-24081 (24x CD-R, 12x CD-RW, 24x CD, 8x DVD)
AUDIO	
Soundcard	Integrated SoundMax
Speakers	Built into monitor
FINE DETAILS	
Case	Custom PC Power and Cooling
Fans/extras	Rolling case, 250-watt mini power supply.
Mouse	Logitech MX500 Wireless
Keyboard	Logitech Elite
BUNDLE	
Microsoft Windows XP Professional, Nero, WinDVD	
BOOT: 29 sec.	**DOWN: 9 sec.**

Copyrighted material

Fujitsu Lifebook P2120

Maximum battery life and minimum performance



The slowest thing we've ever loved.

Despite their convenience and small size, sub-notebooks have always had one glaring weakness: no damned optical drive. If you wanted to watch a DVD, install software, or burn a disc, you had to lug around a clumsy external optical drive.

Fujitsu's first P-series notebook broke that barrier by offering a DVD-ROM/CD-RW combo drive in a notebook that weighed just 3.5 pounds. The P2120 builds on the original with some updated hardware. The main upgrades include a faster Transmeta Crusoe CPU (it's now 933MHz), a higher-res screen, integrated Wi-Fi, ATI Radeon graphics, and USB 2.0 support. You also get more RAM, a larger hard drive, and 16x CD-R speeds.

Battery life remains good as well. And when we write "good battery life," we mean it. Most sub-, mini-, and ultra-portable notebooks are lucky to give you an hour's worth of juice, but in our tests, the P2120 played a DVD movie for a bit more than 2.5 hours using its "extended" 3800mAh battery. The computer's optical drive can be substituted for a second 3400mAh battery, as well.

Fujitsu says the extended battery will provide up to six hours of run time. We think this is optimistic, but if you're just writing e-mail or word processing, we can easily imagine more than four hours of battery life. And with the second battery, we bet the Fujitsu could keep running for eight hours, provided you don't hit the Wi-Fi, CPU, or hard drive too often. (Of course, results may vary.)

Some people might complain that a 10.1-inch screen is too small to support a resolution of 1280x768, but we say boo on that. In fact, we're actually glad Fujitsu opted to up the resolution. Most sub- and mini-notebooks sport 1024x768 and lower resolutions, and that's just too little real estate for the number of applications we run today.

So what's the catch? Performance. The 933MHz Crusoe is easily outclassed by an 800MHz Pentium III, not to mention higher-clocked Pentium 4s and Mobile Athlon XPs. In fact, the Crusoe processor is painfully slow compared with all modern CPUs. On the Lifebook P2120, computing moves in slow motion when Windows XP Pro is allowed to set the visual effects. But with all of XP's fancy-pants fades and animations turned off, the P2120 offers a normal desktop navigation experience.

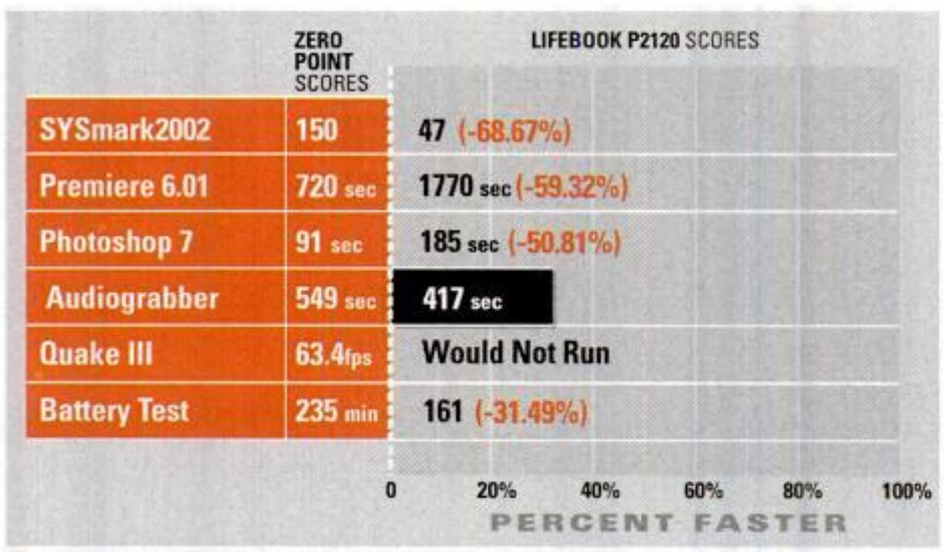
Despite the inclusion of a Mobility Radeon chip (the part that actually preceded the Mobility Radeon 7500), any serious gaming is out, of course. With just an 8MB frame buffer, we didn't even bother running our own custom *Quake III* test demo on the Lifebook (the test uses high-res textures). But we did run a stock *Quake III* demo at 800x600 and saw scores in the low teens. We saw similarly slow-as-molasses scores in other benchmarks.

Sub-notebooks really aren't about maximum performance, though. They're about maximum usability and maximum battery life. With its two USB 2.0 ports, built-in Ethernet and modem, Wi-Fi support, and 1280x768 screen, the Lifebook P2120 is an amazingly capable notebook for its size.

—GORDON MAH UNG

UNDER THE HOOD

THE BRAINS	
CPU	933MHz Transmeta Crusoe (512K full-speed L2 cache)
RAM	256MB PC133
I/O ports	Two USB 2.0, one 10/100 Fast Ethernet, Video out, S-video out, FireWire A, one PC Card, Headphone, Mic in, Line out, LAN
Modem	Lucent Soft Modem
LAN	Intersil Prism Wi-Fi Realtek RTL8139 10/100 Ethernet
DISPLAY	
Video	ATI Mobility Radeon 8MB frame buffer
Display	10.1-inch, 1280x768
STORAGE	
Hard drive	Toshiba MK4018GAP 40GB 4,200 RPM
CD-RW/ DVD-ROM	Toshiba DVD-ROM SD-R2212 16x CD-R, 10x CD-RW, 8x DVD-ROM, 24x CD
AUDIO	
Audio chip	SigmaTel AC97
FINE DETAILS	
Lap weight:	3.5 pounds (3.8 with two batteries)
Carry weight:	4 pounds
BUNDLE	
Windows XP Pro, Microsoft Works 7.0 , Drive Image SE, McAfee Security Center, McAfee VirusScan, Quicken 2003 New User Edition	
BOOT: 50 sec.	**DOWN: 30 sec.**


ZERO POINT SCORES
LIFEBOOK P2120 SCORES
SYSmark2002 150 47 (-68.67%)
Premiere 6.01 720 sec 1770 sec (-59.32%)
Photoshop 7 91 sec 185 sec (-50.81%)
Audiograbber 549 sec 417 sec
Quake III 63.4fps Would Not Run
Battery Test 235 min 161 (-31.49%)
0 20% 40% 60% 80% 100%
PERCENT FASTER

Our zero-point notebook is a Dell Dimension 8200, and includes a 1.7GHz P4-M CPU, 256MB DDR266, a 64MB 128-bit DDR GeForce4 Go graphics chipset, and a 5400rpm ***IBM Travelstar 60H hard drive.***

MAXIMUMPC VERDICT

Lifebook P2120
FUJITSU

NINERS

Ultra portable and ultra capable. Gives you the features of a big notebook in a tiny package.

GIANTS

The Crusoe runs cold, but that's probably because it puts out the computing power of an ice cube.

www.fujitsu.com
$1700

9

Copyrighted material

Memorex DVD+RW/+R Burner

The quintessential also-ran

THE BUNDLE

Ahead Nero
Sonic MyDVD 4.0
ArcSoft Showbiz
CyberLink PowerDVD XP

Now that DVD burners are becoming ubiquitous, we finally have the luxury of comparing performance across a wider variety of drives, even within specific formats. This is good for us, and good for you. It's not so good, however, for Memorex. A DVD can't just work as advertised anymore. It has to do more than other models—burn faster, offer more features, and preferably cost less. Memorex's combo DVD and CD burner doesn't lead in any of these categories.

These days, the drive to beat is Sony's multiformat DRU-500A DVD/CD burner. Memorex's transfer rates (during read tests) were respectable, coming in just above Sony's drive, but the Memorex burner writes to only the DVD+R/W format, at a top speed of 2.4x for both the write-once and rewriteable variants. Meanwhile, DVD-ROM reads are stuck at 8x. What's worse, a "combo" drive that can burn CDs at just 12x is unlikely to replace even the CD burner you handed down to your little sister.

Digital audio extraction was dismal; the drive started out fine, but slowed down near the outer tracks, resulting in terrible overall results during extraction from long CDs. This suggests the drive could use more vibration dampening. No easy explanation exists, however, for why the drive would utilize nearly 50 percent of our CPU resources reading at 8x (we performed this test multiple times with consistent results). The Memorex also lists for $30 more than Sony's far more versatile unit.

We don't have any major beefs with the basic performance of this drive. It's perfectly competent and does write to the write-once DVD+R format, which we've found is highly compatible with set-top DVD players. It's just not anywhere near the best in its drive category for features, price, or performance. Not even close.

—LOGAN DECKER

DUAL-LAYER: We didn't experience any operational pains using Memorex's DVD burner, the read transfer rates were above average, and the drive comes with *Nero* software.

DOUBLE-SIDED: Sony's DRU-500A is a far, far better deal.

MAXIMUM PC VERDICT: 5

$380, www.memorex.com

THE MEMOREX REPERTOIRE

Writes to:	DVD+R	2.4x
	CD-R	24x
Rewrites to:	DVD+RW	2.4x
	CD-RW	10x
Reads:	DVD-ROM	8x
	CD-ROM	32x

BENCHMARKS	DVD	CD
Average data transfer (MB/sec)	7.2	3.6
Random/full-stroke seek (ms)	135/281	111/243
Audio extraction (secs)	-	4:22
Data CD burn (min:secs)	-	6:44
Data DVD burn (min:sec)	25:21	-
CPU utilization (8x)	12%	46%

NOTE: The data CD burn test uses the bundled applications to create a 647MB CD-R. The data DVD burn test uses the bundled applications to create a 4.25GB DVD. The audio extraction test uses a commercially stamped 70:07 minute audio CD. All tests were performed using Verbatim media, except where noted.

Panasonic DVD-RAM/DVD-R MultiDrive II

Will two more flavors do you any favors?

THE BUNDLE

BHA B's Recorder Gold 5
BHA B's Clip 5 (for packet writes)
Sonic My DVD 3.5
InterVideo WinDVD 4
DVD-Movie Album SE
FileSafe (for backup)

DVD-RAM was the first recordable DVD format approved by the DVD Forum (which, by the way, was supposed to prevent format wars—hah!). But take one look at the DVD-RAM cartridge, and you can guess why the format didn't catch fire with consumers. Nonetheless, businesses understand the advantages of DVD-RAM, and in Europe and Japan it's enjoying something of a renaissance inside digital video recorders.

Panasonic is now reintroducing DVD-RAM to consumers in a more palatable unit that combines DVD-RAM with DVD-R/W. DVD-RAM offers some significant advantages if all you want to do is back up your PC. First, DVD-RAM media that's formatted for packet-writing uses tiny 2Kb clusters; this improves retrieval times and minimizes storage loss due to defective "blocks" on the media. Second, data can be stored and accessed anywhere on DVD-RAM media without the need for "linking blocks" and other space-consuming features. Thus, a DVD-RAM disk acts more like a hard drive than a traditional CD-ROM drive. Third, while the cartridge might not be glamorous, it does protect the media.

The MultiDrive II offers a good transfer rate for CDs, and excellent transfer rates for DVDs. Access times are minimal across the board. Unfortunately, the MultiDrive shoots itself in the foot by sticking with 2x DVD-R write speeds instead of the newer 4x speed offered by Sony's multiformat drive. As for CD burning speeds, they're strictly turn-of-the-century. And here's an editor's grudge: The manual includes instructions in three languages, but doesn't separate them, so reading the booklet is a cumbersome, if vaguely educational, process.

For media and data files, 4.7GB of storage is plenty. Even better, 9.4GB media is also available (though you'll have to flip the disc 45rpm-style, and even this capacity is insufficient for partition backups). Despite its advantages, the DVD-RAM capabilities of the drive should be used only to augment the much more versatile DVD-R/W format.

—LOGAN DECKER

PANAVISION: The LF-D521U offers the write-once DVD-R format for superior set-top player compatibility. You don't pay a huge premium for DVD-RAM use, and Panasonic bundles lots of useful software.

MACROVISION: DVD-RAM has very little to offer the average user. Drive speeds, particularly CD-R/W, are behind the curve.

MAXIMUM PC VERDICT: 6

$400, www.panasonic.com

THE PANASONIC REPERTOIRE

Writes to:	DVD-R	2x
	DVD-RAM	2x
	CD-R	12x
Rewrites to:	DVD-RW	1x
	DVD-RAM	2x
	CD-RW	8x
Reads:	DVD-ROM	12x
	CD-ROM	32x

BENCHMARKS	DVD	CD
Average data transfer (MB/sec)	10.8	4.1
Random/full-stroke seek (ms)	117/237	118/219
Audio extraction (secs)	-	3:56
Data CD burn (min:secs)	-	6:43
Data DVD burn (min:sec)	29:41	-
CPU utilization (8x)	13%	3%

NOTE: The data CD burn test uses the bundled applications to create a 647MB CD-R. The data DVD burn test uses the bundled applications to create a 4.25GB DVD. The audio extraction test uses a commercially stamped 70:07 minute audio CD. All tests were performed using Verbatim media, except the DVD-RAM test, which used Panasonic's bundles media.

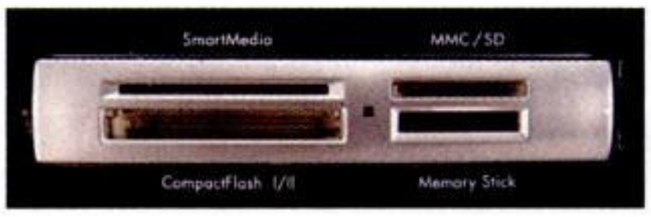
Copyrighted material

HP Media Center 883n

Digital entertainment in an underpowered, overpriced box

Do you need this rig in your living room?

At first glance, HP's new Media Center PC is a blast from the past. It's got a 2.6GHz P4, PC2100 DDR memory, and a horribly outdated GeForce4 MX 420 videocard with just 64MB of RAM. But let's forget about the anemic hardware for a second and focus on the OS. The Media Center version of Windows XP is designed to turn a common PC into a full-fledged digital entertainment center, complete with TiVo-like TV recording functionality that can be adjusted with a remote control.



This handy little fella can handle SmartMedia, Memory Stick, MultiMediaCard, Secure Digital (SD), CompacFlash I/II, and IBM Microdrive. We hear the next version will butter your toast.

The new OS module gathers several multimedia features into one fairly user-friendly interface—an attractive proposition for newbies who've never used third-party "digital media" programs. But for power users who've been around the block, Media Center leaves something to be desired. For starters, the OS includes a music cataloging feature that dumps all your digital audio file details into a database for simple retrieval, but if you want to rip MP3 files, you'll need to load *Windows Media Player* and purchase an MP3 add-on for the app. Media Center also features a rudimentary picture gallery feature, but it's not fundamentally different from the filmstrip mode in Windows Explorer. You get a soothing fade-and-dissolve effect as you parse through your image library, but it's still no replacement for a legitimate image-management app such as *ACDSee*.

As for video files: You can download digital video from your camera onto the machine's honking 120GB Samsung hard drive, but if you want to get all Spielberg on your clips, you'll have to load ArcSoft *Showbiz*. Oh well, at least Media Center's plug-in for *PowerDVD* XP (a third-party DVD decoder) features true 5.1 surround sound. Normally, you would have to upgrade to a better version of *PowerDVD* XP for this feature, but digging around the DVD settings within Media Center reveals the 5.1 sound option.

Media Center's best benefits are its TiVo-like "time-shifting" and recording abilities. You can stop, rewind, and fast-forward live TV, and schedule multiple recording sessions within an intuitive menu (programming schedules download straight into your PC!). Setup was relatively painless, but be aware that when hooking the PC to a cable box, your rig can be no farther than 15 feet from the box, and channel-switching suffers the same tedious lag that TiVo users already know and despise.

If you have your eye on the HP 883n, but would like to ditch its lame videocard for a better 3D accelerator, proceed with caution. The Media Center package for Windows is designed for a short list of hardware, so all rigs that run the OS defy easy upgrading. So far, all the Media Center rigs that we've heard of sport nVidia videocards and P4 CPUs, and as far as we know, Alienware is the only Media Center vendor who's ditched the GeForce4 MX 420 for something more high-powered—a Ti 4600. Our test rig contained a 48x CD-ROM drive and an HP-branded DVD+RW, a combo that prevents disc-to-disc DVD copying. This is frustrating, considering that DVD-ROM drives are hardly more expensive than CD-ROM drives, but we suspect that the OEMs of the world are wary of raising the ire of the movie industry (see page 70 for a related review).

This HP Media Center PC isn't geared toward the performance user. You can build a faster machine with essentially the same features yourself (just be aware that the Media Center OS module isn't available as a stand-alone installation; see last month's How-To section). But for a beginner who's just getting into hard drive–based TV recording and digital video production, it may be a better option than building a PC entertainment center from scratch.

—TOM MCNAMARA

UNDER THE HOOD

THE BRAINS	
CPU	2.66GHz Pentium 4
Mobo	HP-Branded Intel 845G
RAM	512MB PC2100 DDR
I/O ports	Three USB, two FireWire, PS/2 mouse, PS/2 keyboard, serial ports, mic input, VGA, S-video, TV-in, TV-out
LAN	Onboard Intel 10/100
DISPLAY	
Videocard	64MB nVidia GeForce4 MX 420
STORAGE	
Hard drive	120GB Samsung (5400RPM) SV1204H
DVD+RW	HP 200j
CD-ROM	HDLS 48x
AUDIO	
Soundcard	SoundBlaster Audigy
Speakers	Klipsch ProMedia 5.1
FINE DETAILS	
Case	HP mid-tower
Fans/extras	6-in-1 media card reader, front FireWire port
Mouse	HP PS/2 optical scroll mouse
Keyboard	HP multimedia keyboard
BUNDLE	
WordPerfect Productivity Pack, HP Picture & Video Toolkit, Intuit Quicken Financial Center, Encyclopedia Britannica Premium Service Online, Sonic MyDVD	
BOOT: 43 sec.	**DOWN: 35 sec.**

MAXIMUMPC VERDICT

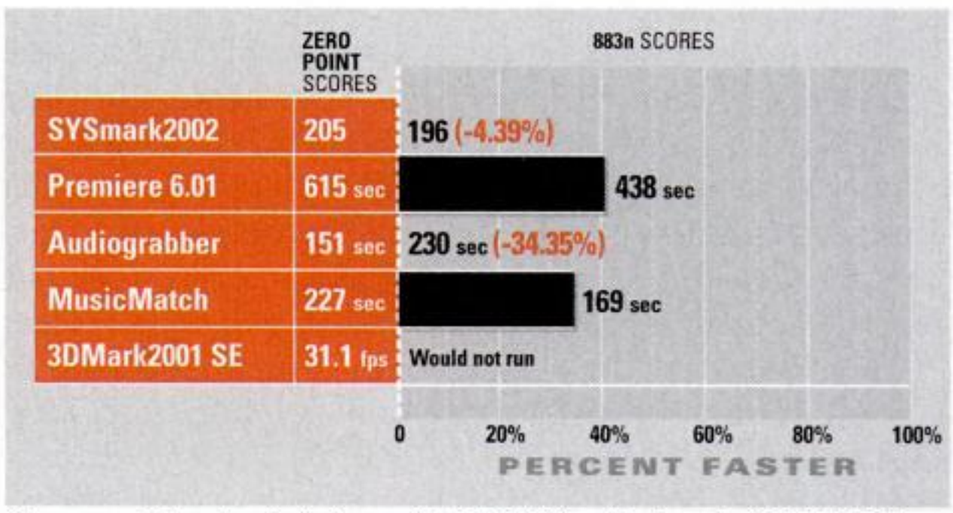
883n
HEWLETT-PACKARD

+ ROBOCOP
Buttons galore, loads of bundled software, and good for newbies.

– HAL 9000
Slow and overpriced for what it delivers

www.hp.com
$2,000 (w/o monitor)

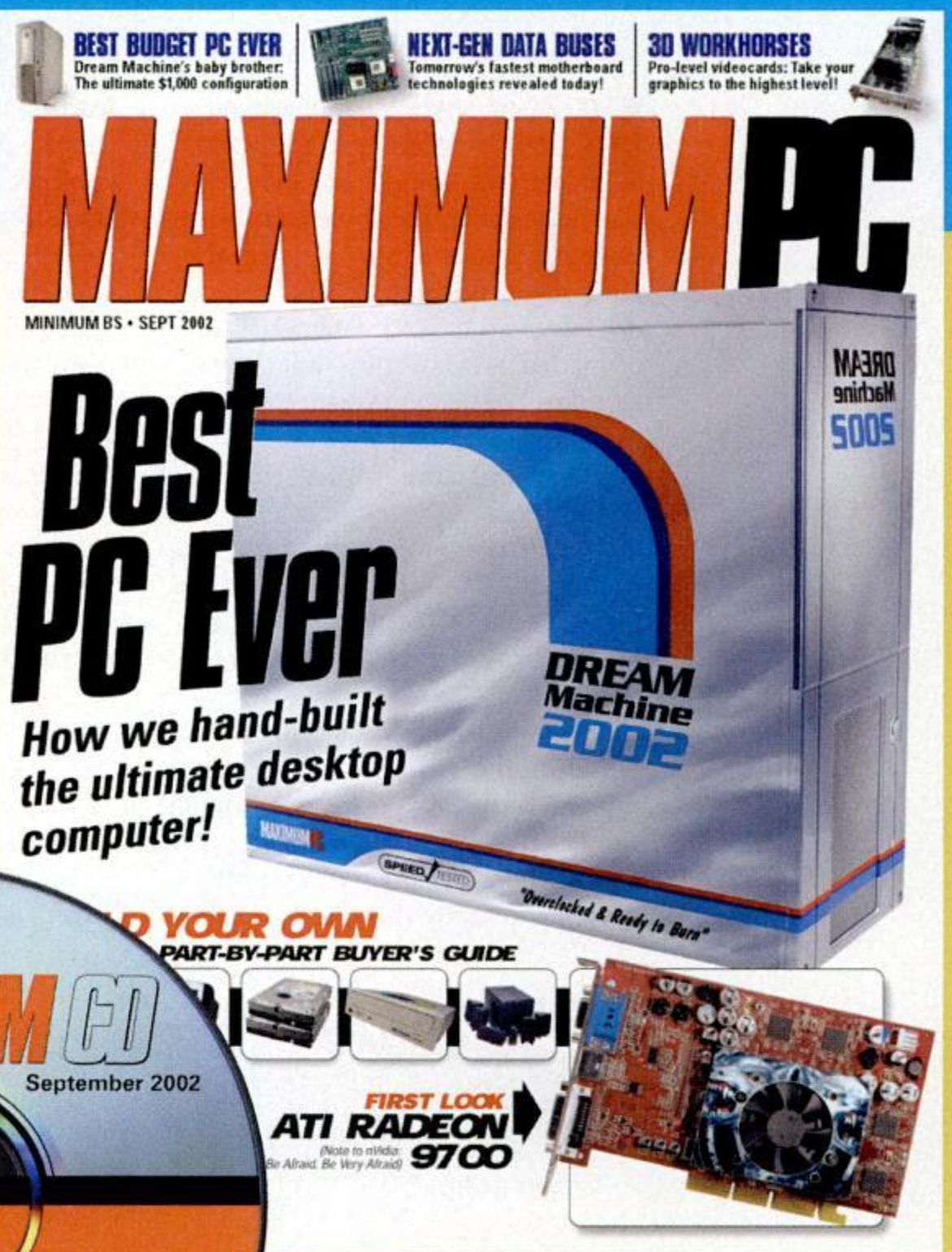
6



Our zero-point system includes: an Intel D850MV motherboard, a 2GHz P4 CPU, 512MB PC800 RDRAM, a GeForce4 Ti 4600 videocard, and a Western Digital 1000BB hard drive (2MB cache).

Copyrighted material

12 issues PLUS 12 CD-Roms for only $29.95



MAXIMUM PC

A savings of 68% off the newsstand rate!

Subscribe to MaximumPC at www.maximumpc.com or by calling toll-free 1.800.274.3421.

Offer good in U.S. only. Cover price is $7.99. Canada: U.S. $40, includes GST. Foreign: U.S. $56. Prepaid in U.S. funds only. Please allow 6-8 weeks for delivery of first issue.

Copyrighted material

Logitech io Personal Digital Pen

Going back to the drawing board

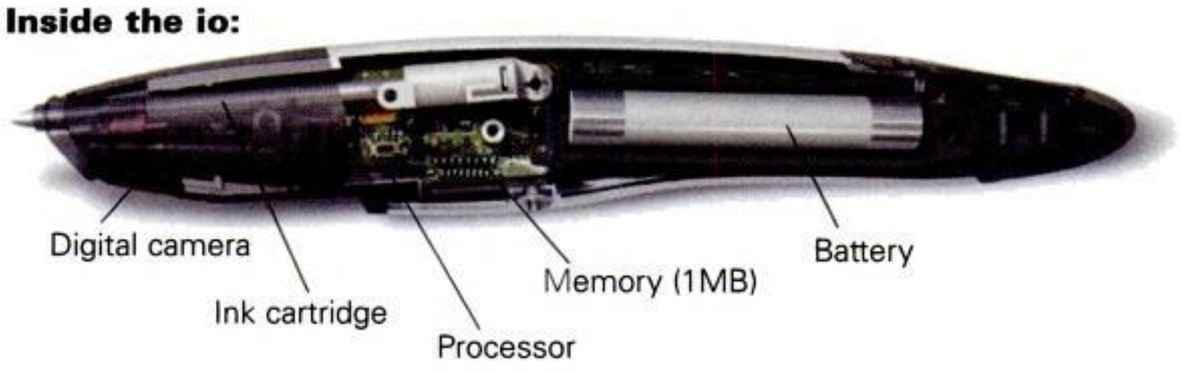
Old MacDonald had a pen, E-I-E "io".

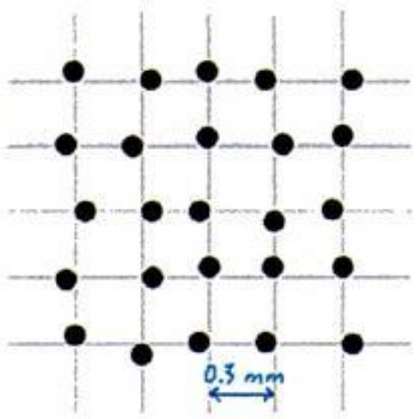
Here's the skinny on Logitech's latest input device: You write with the io pen, and every single stroke you scribble is instantly digitized into a vector-like format. Drop the pen into its USB dock/recharger, and your pages are uploaded as image files that can be saved in Logitech's proprietary PEN format, or exported to JPG or EMF (a vector file format). It works, period. Beautifully.

Of course, there's more to the story than that.

The io uses a technology originally developed by a Swedish firm called Anoto (check out **www.anotofunctionality.com** for a description of how the pen works). Although the pen packs a tiny digital camera that takes 50 pictures a second as you write, the key to the device is actually the special paper you need to write on. The paper itself is ordinary, but it's printed with an extremely fine pattern of barely perceptible dots (you really have to squint hard to see them). These dots are arranged in an offset pattern around a virtual grid.

Inside the io:





Close-up of the special paper that the io pen requres to function.

Although our first reaction to the special writing surface was dismay (especially considering the price: $25 for a three-pack of 80 double-sided sheets), the advantage to the grid design becomes quickly apparent. Because every 6x6 grid of dots refers to a unique position on each sheet of paper, the pen knows exactly where on the page you are writing. This is why you can shut off the pen (by replacing the cap), and start writing again later lower on the page—the io will still upload your page looking exactly as it does on the paper. The grid system also allows applications to define certain areas of the page as virtual buttons.

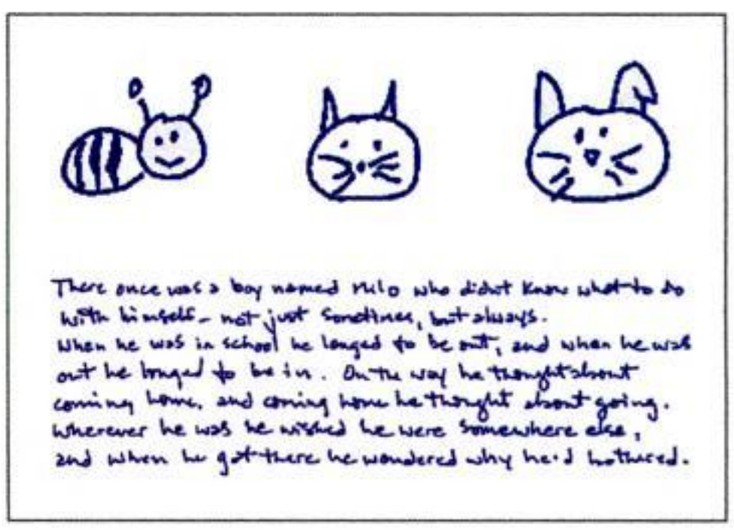
For example, the included notepad includes fields at the bottom of the page in which you can specify a subject and e-mail recipient. When you check the "E-mail" box at the bottom of the page, the page will be uploaded and e-mailed to your recipient the next time you dock the pen. Without a grid system, it's difficult to see how a write-anywhere pen could do this without clumsy hardware buttons.

But this leads us to the pen's drawbacks and shortcomings. First of all, the only applications supported by the pen's export functions are Microsoft *Office* apps— specifically, *Word* and *Outlook*. Jotting down appointment details and automatically exporting them to your *Outlook* calendar is great, but if you don't use *Outlook*, you're outtaluck. Second, the minimal character recognition afforded by the pen isn't terribly accurate, and it's limited to writing on specific fields preprinted on the paper surface. Even after "training" the pen twice, it failed to recognize several characters in an e-mail address, and as we all know, it takes only one inaccurate character for an unsuccessful send.

The io's internal camera even compensates for the angle at which you write, and the resulting documents are faithful to the originals—even zoomed in. But the poor character recognition, expensive paper, bulky size of the pen itself, and the limited application support drag the entire package down. Still, this is a first-generation product, and we suspect most of the problems will be easy to address in future iterations.

The io may be far from perfect, but it does work, and it's easy to carry around and use. Plus, you can drop your pad of paper, pick it up, and keep using it. Try that with your highfalutin Tablet PC.

—LOGAN DECKER


There once was a boy named Milo who didn't know what to do with himself - not just sometimes, but always.
When he was in school he longed to be out, and when he was out he longed to be in. On the way he thought about coming home, and coming home he thought about going. Wherever he was he wished he were somewhere else, and when he got there he wondered why he'd bothered.

If this looks bad to you, blame the handwriter, not the pen. Digitization works flawlessly, though we don't know why the software only permits export to JPG and EMF. We'd like to see more raw output options.

Copyrighted material

USB Kickdown

Lexar unseats the reigning king of USB keys

If you don't yet have a USB key, you don't know what you're missing—they're the only viable replacement for floppies. Our only beef with the newer keys is that as their capacities grow, their practicality diminishes. USB 1.1 is simply too slow a connection for any key exceeding 128MB.

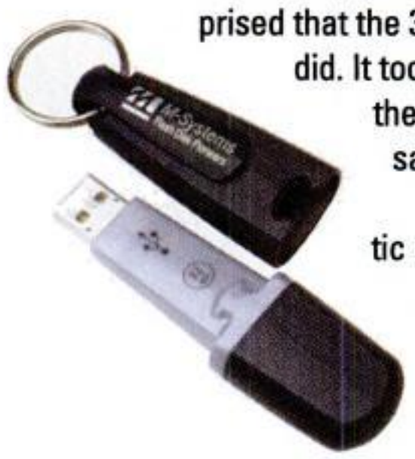
Luckily, high-capacity USB 2.0 versions have arrived. Of course, you'll need USB 2.0 motherboard support or a PCI add-in card to get the maximum performance from these keys, but they'll still work with USB 1.1.

—LOGAN DECKER

M-Systems 32MB USB 2.0 DiskOnKey

The classic DiskOnKey was the first flash-memory key that didn't require drivers to arrive in our Lab. Since then, M-Systems has driven capacities up to 512MB while adding useful security and disk management utilities (download them at **www.diskonkey.com**).

Given M-Systems' record for technical innovations, we were a little surprised that the 32MB USB 2.0 DiskOnKey didn't perform better than it did. It took 34 seconds to transfer 32MB. Yes, that's almost half the 56 seconds it took for the USB 1.1 version to do the same thing, but not nearly as fast as Lexar's key.



The packaging pictured here may change, but whatever it looks like, you need one.

Available on the DiskOnKey web site are two fantastic utilities. *KeySafe* allows you to password protect any portion of the DiskOnKey's memory, while *MyKey* includes options to synchronize your key with any folders you choose from your PC. The measly capacity of our review unit hardly shows off the benefits of the faster transfer rate, but, hey, 22 seconds saved are 22 seconds earned.

DOUBLE CAPPUCCINO: Faster than the USB 1.1 version, and works with two great software utilities.

DECAF SOY LATTE: The capacity is pathetically small (though DiskOnKey will certainly release much higher capacities by the time you read this). Transfer rate lags behind Lexar's key.

MAXIMUM PC VERDICT: 7

$65 (32MB), www.diskonkey.com

Lexar's 256MB USB 2.0 JumpDrive

The JumpDrive 2.0 is the prince of tiny portable storage.

Although the JumpDrive has a capacity of 256MB, we performed an initial test with just 32MB of data for a true head-to-head comparison with the DiskOnKey. The DiskOnKey did not fare well—the JumpDrive copied in just 23 seconds what the DiskOnKey needed 34 seconds to do. Although transfer times with the JumpDrive varied widely (between 2:59 and 3:50 for transferring the full 256MBs), the device's times are still a hell of a lot better than what you'd get from a USB 1.1 device. (It took 10:48 to transfer 256MB of files with our old USB 1.1 DiskOnKey.)

Unfortunately, Lexar doesn't yet offer any downloadable software for the key, not even a rudimentary security app. But, hey, you can always zip up and password-protect your files on your own.

COLD SAKE: The JumpDrive is far and away the fastest USB key we've ever tested, and it's not much bigger than your thumb.

HOT BEER: No utility software is included or available for download. Expensive—ka ching!

MAXIMUM PC VERDICT: 9

$200 (256MB), www.lexarmedia.com

Solutions powered by Gateway. Success powered by you.

Axiom Integration
Digital Asset Protection Services
Jeff Vaske, *Co-Chief Executive Officer*

"The confidence we have in Gateway combined with the attractive economics made Gateway the right partner for our business. We know they will be there for us."

The Challenge:
Find a comprehensive, cost-effective server solution to increase uptime and ensure flow and security of corporate client resources.

The Solution:
Replace existing servers with Gateway's powerful, reliable 935 and 980 series powered by Intel® Xeon™ processors backed by on-site service and expert 24/7 tech support.

The Result:
Rapid server deployment and first-call issue resolution guarantees integrity of Axiom's client data. Uninterrupted operations mean mission-critical helpdesk and web applications are always available to address and satisfy client needs.

Gateway recommends Microsoft® Windows® XP Professional for Business.

Jeff Vaske and Brian Marcuzzo, Co-CEOs of Axiom Integration

Gateway® 980 Series
Featuring an Intel® Xeon™ processor, the 980 series delivers top-grade performance for high-traffic networks demanding networked software and mission-critical applications.

intel inside XEON™

Reliable servers. Dependable service. | 877-313-2652 | www.gateway.com/success |

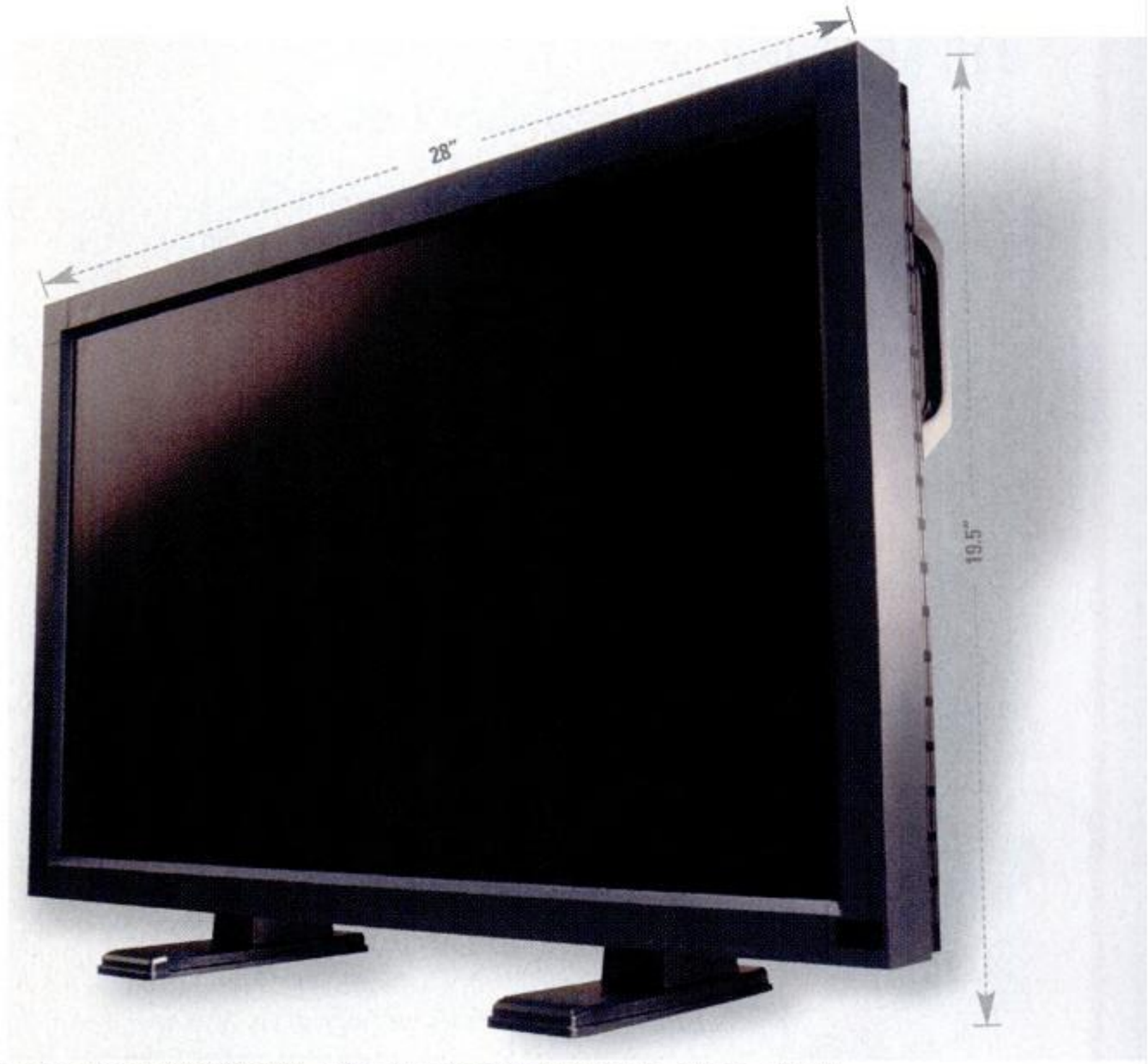
Gateway™ A better way.SM

Copyright ©2003 Gateway, Inc. All rights reserved. Gateway Terms and Conditions of Sale apply. Gateway.com and Gateway Country Stores, LLC, are separate legal entities. Gateway, the Spotted G Gateway Logo, the Spotted G Logo, the Black-and-White Spot Design and "A better way." are trademarks or registered tradmarks of Gateway, Inc. in the U.S. and other countries. The Intel Inside Logo, Intel and Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. Ad: Arnell Group Ad Code: 112180

Copyrighted material

NEC LCD3000

The Swiss Army knife of mongo-large LCDs



"For I am the LCD3000—the undisputed jumbo king of all desktop LCD displays!"

Want to plug an Xbox or DVD player into your monitor? Or perhaps you want the freedom to choose among analog, DVI, and BNC cables for your PC videocard connection? And what about speaker connectivity—would you prefer bare wire terminals or a stereo mini-jack? You'll have a chance to resolve all these questions if you invest in the pricey but versatile NEC LCD3000. Not only does the mongo LCD provide about 30 diagonal inches of flat-panel glory, it's also loaded with just about every input and output option imaginable, and is even appropriate for bridging stereo speaker rigs to set-top entertainment devices (like DVD players and game consoles).

By normal flat-panel standards, the LCD3000 takes up serious desk space, thanks to a wide-aspect-ratio screen that runs about 28 inches from side to side. In fact, if we were to pony up the $4,100 street price, we'd probably use the display primarily for DVD movie playback and gaming. Its 1280x768 desktop is certainly viable for word processing and e-mail, but the sheer size and brightness of the monitor is overwhelming when viewing text from 15 inches away. All of the monitor's connection sockets are clearly labeled, but because they're mounted vertically, cable installation can be awkward.

THE SPECS	
Size	29.5 diagonal inches
Native resolution	1280x768
Pixel pitch	0.500mm
PC inputs	Analog RGB (BNCx5), Mini D-Sub 15-pin, DVI-D
Video inputs	BNC, RCA, S-video, Component (BNCx5)
Audio inputs	RCA L/R (x2), stereo mini-jack
PC output	Analog RGB (BNCx5)
Video output	BNCx1
Audio output	Stereo speaker terminal L/R

The LCD3000 tips the scales at 35 pounds—you can blame the pork on all the silicon that supports the myriad connectors, as well as all the fans that keep the back of the monitor cool (the fans emit a whisper that's noticeable only in near-silent environments). Unfortunately, the monitor can't be tilted or adjusted for height (features you always want in a desktop monitor). Also, its upright position gives the display the illusion of being on the verge of tipping over. Off-axis viewing is exemplary, but you'll still want the screen at eye level for maximum comfort.

Onscreen control buttons are located under the lower right-hand corner of the display. Tweaking brightness, individual color levels, and other controls was difficult because the nubbin-size buttons are both a bit too close to each other and too far away from their labels—we had trouble telling which buttons we were pressing. Image quality, however, was excellent for such a large display. In *DisplayMate* testing, screen consistency was great (i.e., there was no bad perimeter darkening), and the panel did a good job resolving light shades of gray against a pure white background. The panel's ability to resolve dark grays against pure black wasn't so good, but this is typical of many LCDs. Colors were rich, and pixel response was certainly fast enough for games and movies (of course, before buying any LCD, it pays to test for streaking and ghosting in person). Gamma levels can't be adjusted, and the LCD3000's default brightness is too bright for our liking. Cranking up brightness achieves near-nuclear levels.

Text was clear enough when running a Windows desktop off the DVI connector, but the 0.500mm pixel pitch renders noticeably coarse content when the display is up close and personal. But let's get real: The LCD3000 is probably intended for corporate conference rooms and high-rise loft apartments, where people gather 'round the old LCD campfire, five heads at a time. Still, we can see why Alienware included this panel with last month's Predator prototype rig—the LCD3000 offers an awesome and immersive PC gaming experience (we recommend you run a non-stretched screen at 1024x768). We just can't endorse the monitor for close-up Windows desktop use.

One final note: The LCD3000 doesn't have an HDTV tuner. You can plug in HDTV-capable devices such as an Xbox or laser disc player, but this monitor doesn't decipher HDTV cable signals.

—TOM MCNAMARA

MAXIMUM PC VERDICT

LCD3000
NEC

+ CHERRY COKE
Very bright; more connections than a dirty politician.

– CRYSTAL PEPSI
Lower pixel pitch, no gamma adjustment, cannot tilt or rotate screen.

www.necmitsubishi.com
$4,100
8

Copyrighted material

DVDXCpoy

Copy your DVD movies! (Sometimes)

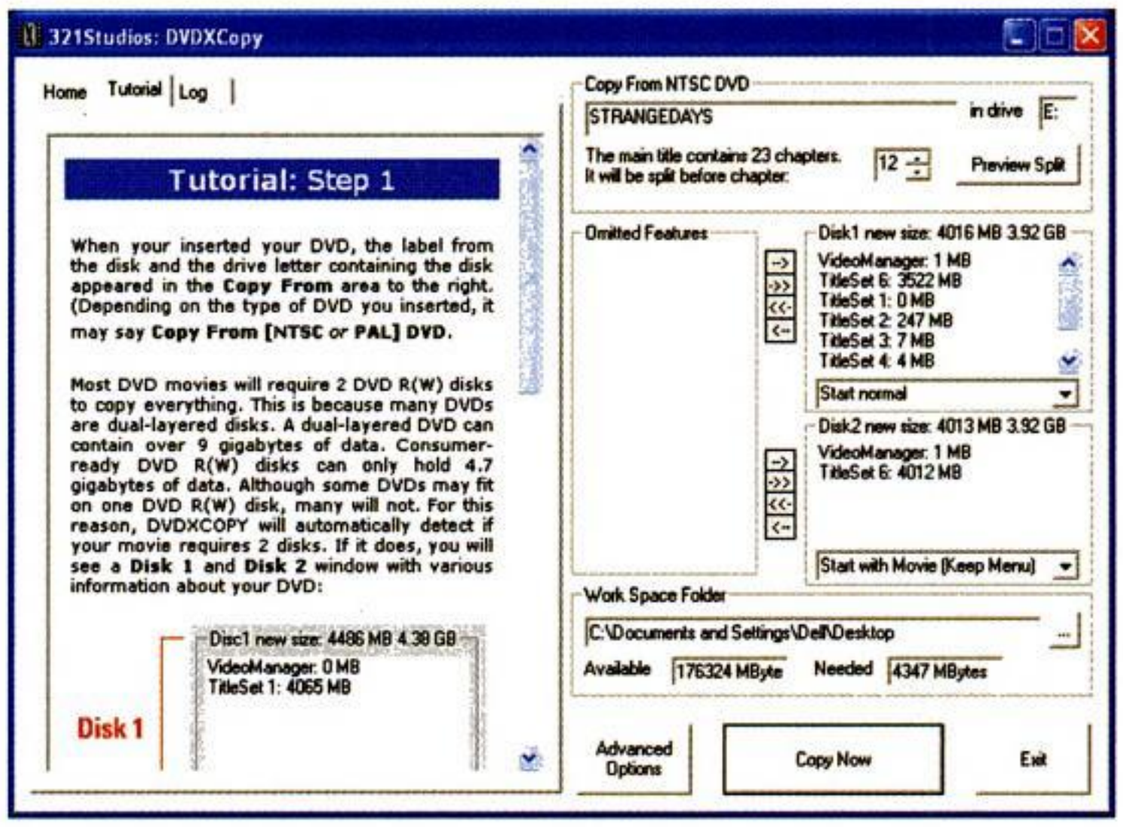
Before *DVDXCopy*, you couldn't copy DVD movies without the help of a 10-page FAQ written by "*H4x0r b0b*" and downloading five different apps from web sites hosted by Geocities. But *DVDXCopy* aims to make DVD movie duping as easy as duping audio CDs, and partially achieves this promise.

The app features a relatively crude interface and is sparse on options, but for the most part, lives up to its hype. We successfully duped several single-layer and dual-layer movies using both a Pioneer A03 DVD-RW/-R drive and a Memorex DVD+RW drive, and played them back on various DVD players. Because most dual-layer DVDs will not fit on a single-layer DVD-R or DVD+R, most movies will have to be burned onto two discs. *DVDXCopy* splits the movie, and gives you some choice over where the split occurs. The copied movies retain the full menus and functionality of the originals.

DVDXCopy is far from perfect, and our release copy was near beta in terms of quality. We had problems trying to copy *Band of Brothers*, and the app simply refused to burn the second disc. When it works, the software makes perfect copies—but it's plenty buggy on movies it doesn't like. And when you add up the numbers, it seems a bit foolish to pay $6 to $12 for two blank discs in order to dupe a single movie that costs just $16.

The app's developer, 321 Studios, has gone to great lengths to prevent you from using the software illegally. For starters, *DVDXCopy* inserts a warning screen on dupes that explains that the disc being played is a copy. Also, the software won't make a copy of a copy, and each copy is fingerprinted to the PC that produced it, so anyone who starts selling copies on the black market might quickly find themselves on an episode of *Law & Order: Intellectual Property Unit.*

In its present state, *DVDXCopy* is only for the bleeding-edge early adopters. We'll revisit the software in six months to see if it deserves a different verdict. Given time, *DVDXCopy* may share the universality of CD-R and MP3 software.


321Studios: DVDXCopy
Home
Tutorial
Log
Tutorial: Step 1
When your inserted your DVD, the label from the disk and the drive letter containing the disk appeared in the Copy From area to the right. (Depending on the type of DVD you inserted, it may say Copy From [NTSC or PAL] DVD.
Most DVD movies will require 2 DVD R(W) disks to copy everything. This is because many DVDs are dual-layered disks. A dual-layered DVD can contain over 9 gigabytes of data. Consumer-ready DVD R(W) disks can only hold 4.7 gigabytes of data. Although some DVDs may fit on one DVD R(W) disk, many will not. For this reason, DVDXCOPY will automatically detect if your movie requires 2 disks. If it does, you will see a Disk 1 and Disk 2 window with various information about your DVD:
Disc1 new size: 4486 MB 4.38 GB
VideoManager: 0 MB
TitleSet 1: 4065 MB
Disk 1
Copy From NTSC DVD
STRANGEDAYS
in drive E:
The main title contains 23 chapters.
It will be split before chapter:
12
Preview Split
Omitted Features
Disk1 new size: 4016 MB 3.92 GB
VideoManager: 1 MB
TitleSet 6: 3522 MB
TitleSet 1: 0 MB
TitleSet 2: 247 MB
TitleSet 3: 7 MB
TitleSet 4: 4 MB
Start normal
Disk2 new size: 4013 MB 3.92 GB
VideoManager: 1 MB
TitleSet 6: 4012 MB
Start with Movie (Keep Menu)
Work Space Folder
C:\Documents and Settings\Dell\Desktop
Available
176324 MByte
Needed
4347 MBytes
Advanced Options
Copy Now
Exit

***DVDXCopy* may be little better than beta in terms of its interface and reliability, but it hints at a promising future for DVD copying.**

DIRECTOR'S COMMENTARY: Let's you archive precious gems, such as *The Day the Earth Caught Fire.*

BEST BOY'S COMMENTARY: Doesn't copy consistently; should still be labeled as beta.

—GORDON MAH UNG

MAXIMUM PC VERDICT: 6

$100, www.321studios.com

ViewSonic AirPanel V110

A remote kiosk for your desktop PC

Using Microsoft's new "Smart Display" technology, the AirPanel is a "thin-client" that complements the brute power of your desktop machine. In fact, you should think of it as a remote desktop control for your PC. None of your apps will actually execute and run on the AirPanel. Instead they're fired up on your desktop machine, and then broadcast via a screen-paint to the AirPanel. The device uses the 802.11b standard, and during actual usage, we found that the AirPanel has great reception for a Wi-Fi device.

By using Windows CE and a power-conserving 400MHz XScale CPU, the AirPanel is miserly with battery life and costs much less than a Tablet PC. Because it doesn't contain a hard drive (which would take time to spool up), the AirPanel is also ready to roll just a few seconds after powered on.

The device requires that your host PC be switched on and left alone when in use—this means that the AirPanel can't be used as a second PC. Even worse, someone can bump your session by logging into your desktop. The AirPanel also requires WinXP Pro and Service Pack 1 (the device ships with an XP Pro upgrade disc, as well as an 802.11b adapter for your host rig).

We had no problems streaming MP3s to the AirPanel (which is equipped with a rudimentary speaker), but a streamed movie lagged as if it were downloading from a 1200 baud modem. Of course, the biggest problem with the AirPanel is its painful $1,000 list price. For that much, you can just buy a full-fledged PC in the form of a notebook.

That said, the AirPanel does fulfill its promise for 90 percent of all Internet activity: reading text and clicking hyperlinks. Kicking back on the couch and checking eBay auctions was a breeze. And for the ultimate guy activity—*L'Internet sur la toilette*—the formfactor and touch screen are perfect.

You can't beat the convenience of the Air Panel. But is it worth the cost?

ViewSonic claims five hours of battery life, but that greatly depends on how much you juice the Wi-Fi connection and the brightness of the screen. During testing, we enjoyed just less than three hours.

If it cost $400, the AirPanel would be a no-brainer. At $1,000, it's a luxury that we'd be reluctant to buy on our editors' salaries.

AIR JORDAN: Lets you check eBay while swinging in the backyard hammock.

AIR SUPPLY: Lacking in power and bandwidth for the price.

—GORDON MAH UNG

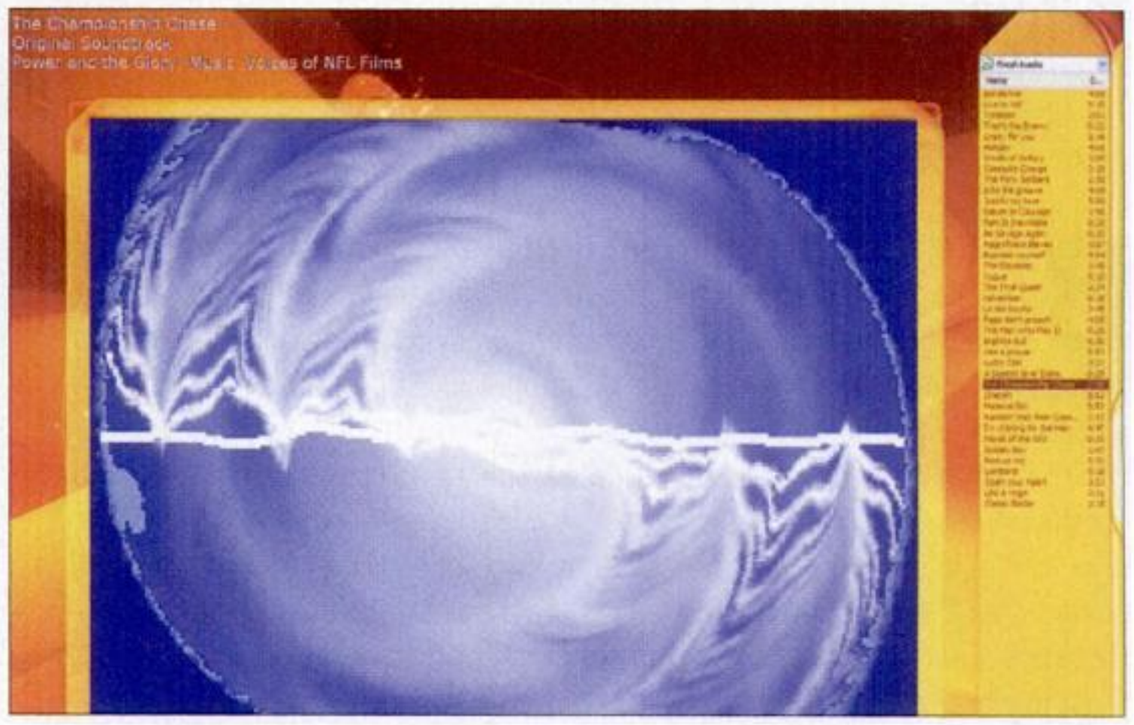
MAXIMUM PC VERDICT: 6

$1,000, www.viewsonic.com

Copyrighted material

Microsoft Plus! Digital Media Edition

From the people who brought you Microsoft Bob



Nosy guests will be unable to haxor your PC because a password and user-name are required to exit Party Mode.

Do we, as consumers, really need another *Plus!* pack? Are the heavens going to fall from the sky if we don't enhance our Windows' multimedia experience? The answer is a resounding *no,* but that didn't stop Microsoft from creating this newest XP add-on. Conveniently enough, the Digital Media Edition of *Plus!* is perfectly timed to coincide with the launch of Apple's *iLife* bundle—the apps that put the "media" in the Mac's multimedia functionality (*iTunes*, *iMovie*, *iPhoto*, and *iDVD*).

The latest *Plus!* pack includes several apps with varying degrees of usefulness. The *Photo Story* app lets you quickly turn photos into video slideshows, complete with narration, music, and semi-automatic pans and zooms. It took us about 20 minutes to make a three-minute slideshow of holiday photos in a Windows Media format (perfect for e-mailing to other people who have *Windows Media Player*).

Enhancements to *Windows Media Player* are also on the bill. Party Mode is perfect for setting up your PC as a party jukebox, while simultaneously allowing you to keep meddling guests from probing your PC. You can set a playlist, select some visualizations, and pick a skin (see upper right), and you've got music for your get-together.

Among the more dubious additions to the *Plus!* pack are *Alarm Clock* (a simple Systray app that will play a song or sound, just like a normal alarm clock), and *Dancer*—something so cutesy that we doubt even Apple would endorse it (see right). *Dancer* simply shows 2D photo-realistic sprites of people dancing around your desktop—they more or less move in time to the music that's playing on your PC. Because they're 2D, they're not able to dynamically dance; they're just a series of sprites that are played in different orders and at different speeds. It's really quite difficult to express the complete lameness of *Dancer* using just words, especially since we've seen the fully 3D animated dancer that WildTangent released a few years ago.

Luckily, *Plus! Digital Media Edition* is a bargain priced at $19 online (retail boxed versions will be on shelves in February). Even if there's only one app in the latest *Plus!* pack that you'd use, it's probably worth your $20.

⊕ **ARITHMETIC:** The *Photo Story* app is actually quite cool, and college students can probably use the Party Mode in *Windows Media Player*.

⊖ **LONG DIVISION:** If you're not interested in the two aforementioned apps, there's probably not much here for you.

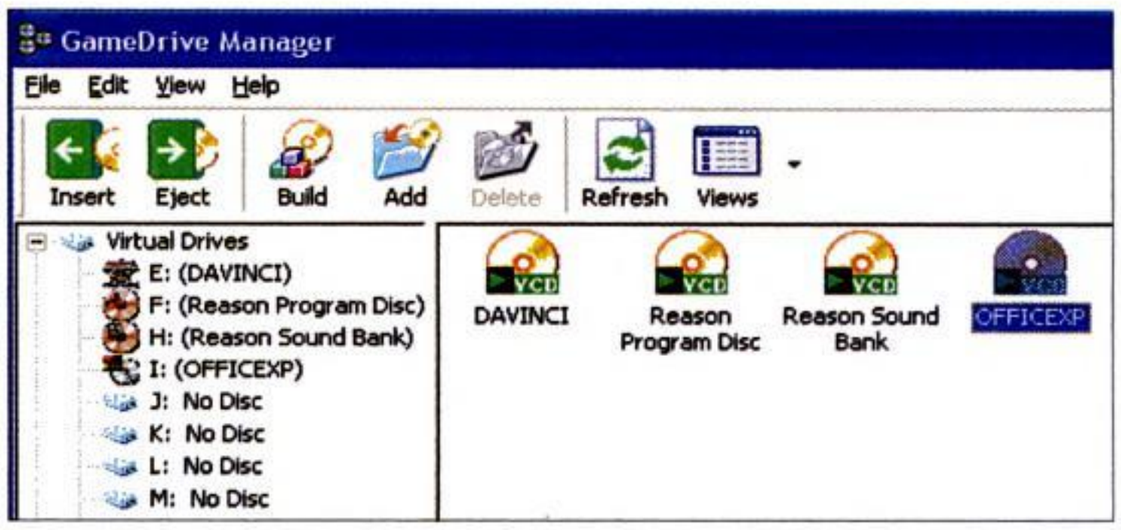
—WILL SMITH

MAXIMUM PC VERDICT: 6

$20, www.microsoft.com/plus

GameDrive Optical Drive Emulator

It's the "Un-CD"



***GameDrive* allows you to install up to 23 hard drive–based "virtual CD-ROMs" on your system. It's useful, but don't expect a speed boost in any game made this century.**

The first thing you see in the *GameDrive* manual is "Turbo Charge Your Game Speed!" Here's the angle: *GameDrive* rips the contents of CDs and DVDs to your hard drive; the rips are saved in a virtual CD format. Up to 23 of these so-called VCDs (not to be confused with Video CDs) can then be mounted by the *GameDrive Manager* as virtual discs. Because today's slowest hard drives still push data faster than the highest-performing optical drives, your gaming performance should improve. You can't lose, right?

The funny thing is, loading virtual CDs to play games is actually the *least* useful feature of the software. Just about every game on Earth gives you the option of a full installation of all the game's assets onto your hard drive, so the only performance improvement you're likely to get is from prehistoric games that run solely off the CD.

The *real* advantage is that you no longer need the game CD to run the game—the executable doesn't know the difference between a real CD-ROM drive and a virtual one. Unfortunately, while some games were converted to VCDs in just minutes, other copy-protected titles took as long as *10 hours* to duplicate.

When we loaded a few titles that do run from CD, the speed increase was significant. Encyclopedia searches, and watching a working model of Leonardo Da Vinci's Striking Trebuchet from a documentary CD—these tasks all performed without the usual stilted playback. We even loaded Microsoft's *Office* CD to our hard drive, where it installed in a fraction of its normal installation time. And with the virtual disc loaded on our PC, we no longer have to face the heartache of trying to install a feature that requires the original CD when it's not handy.

Although *GameDrive* can make VCDs of DVDs, it doesn't do so for commercial DVD Video (*GameDrive* is unable to decrypt the video files). That's too bad, because watching DVDs from the hard drive could squeeze a lot more battery life out of notebooks. *GameDrive* is a somewhat esoteric application that's useful for a fairly small segment of PC users, but it does work, and it works well. And that's what we look for in any PC utility.

⊕ **VIRTUAL CDS:** *GameDrive* will pay off mostly for notebook users who don't want to carry around CDs. Supports command-line arguments for game "enhancements."

⊖ **VIDEO CDS:** We saw no improvement in game performance. Can't rip DVD Video.

—LOGAN DECKER

MAXIMUM PC VERDICT: 7

$30, www.farstone.com

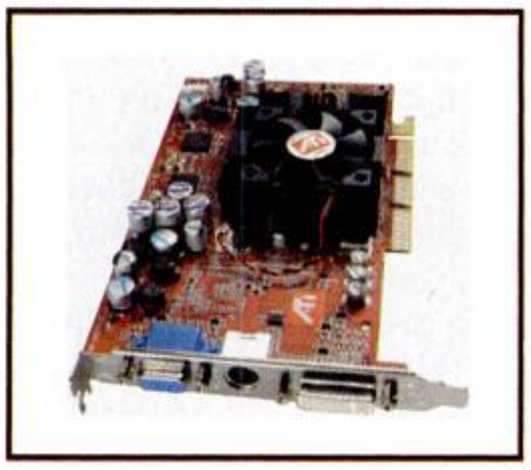
Copyrighted material

Patriotic PC Case Modding Contest

Grand Prizes Now Worth $1,200

We don't care if you lean to the left or lean to the right. How you manifest your patriotism is up to you. But we do want your submission for our Patriotic PC Case Modding Contest to be as spectacular as possible. Your custom-designed rig need not include any American flag motifs, but it must allude to some type of ideal or institution that makes America the greatest nation on the planet in which to express one's creativity. Seriously, folks, do you think Iceland could have come up with breakdancing?

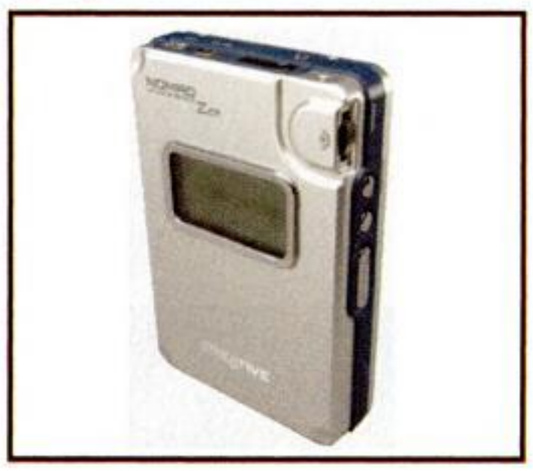
Each of our three winners will receive the following $1,200 bundle:



ATI All-in-Wonder Radeon 9700 Pro videocard

PC Power & Cooling Turbo Cool 475-watt power supply

120GB Western Digital Special Edition Caviar hard drive with 8MB cache



Creative Labs Zen Jukebox MP3 player

RULES

Your submission packet must include your name, street address, and daytime phone number; at least three high-resolution JPEGs of your patriotic creation; and a 300-word description of what your PC represents, how it was constructed, and what PC parts and nontraditional materials went into its making. All contest entries must be full-fledged, working PCs.

E-mail your submission packet to input@maximumpc.com by no later than April 15, 2003 (that's Tax Day folks—oh, the irony!). Winners will be contacted by May 1, and the three winning entries will be featured in our July issue.

Message to Canadians: Yes, you can enter the contest, and your box can be either American-themed or Canadian themed. (Hey, why not? We already share a porous border and a couple of professional sports leagues.) Message to Americans: Don't let the Canadians beat us!

SUGGESTED THEMES

"Easy Rider"
"Illegal Fireworks: Boy's Best Friend"
"July 20, 1969"
"Spacious Skies, Amber Waves, and Purple Mountains"
"Super Bowl Sunday"
"Rosie the Riveter"
"Lyle the Dot-Com Bastard"
"Woodstock"
"The Right to Bear Arms"
"Baseball, Hot Dogs, Apple Pie, and Chevrolet"
"Niagara Falls"
"September 11, 2001"
"Devil Went Down to Georgia"
"I'm a Yankee Doodle Deejay"
"Burning Man: A New American Tradition"
"Moosehead, Eh?"

Copyrighted material

SimCity 4

Welcome to your office, Mayor Jackass

***SimCity 4* lets you zoom in so close to your city that you can see every little detail. Here, our brave firefighters battle a blaze downtown.**

Running a city is easy, right? What's there to do besides cut school funding, jack up taxes for the poor, and give fat-cat industrialists big tax breaks? Sure, you could be a touchy-feely mayor and try to make all the precious "little people" happy, but you'd probably just run your town into the ground anyway.

Benevolent? Malevolent? It just doesn't matter. The most venerable of all sim games, now in its fourth version, will accommodate and punish all politicians alike.

The basics of *SimCity* remain the same. You zone the land in your city as residential, commercial, or industrial, then you provide infrastructure features and necessary services such as power, water, and fire protection. After that, the game is as simple as zoning new areas for growth and adding new services (such as schools and hospitals). As your Sims clamor for that deluxe apartment in the sky, you tweak the budget so that your expenditures don't overtake your income.

Naturally, the full assortment of disasters is available for budding mayors to test their infrastructures. Pictured here is the volcano, which will undoubtedly be shown in every review of the game.

SimCity 4 uses a 3D engine instead of the old sprite-based engine. Although every object in the city is a 3D model, the camera is still limited to the God's view perspective of past *SimCity* games to optimize frame rates and scroll speed. Our favorite graphical tweak occurs at sunset, when streetlights pop on, illuminating the byways of your borough.

The biggest enhancement to *SimCity 4* is its "region game." In the past, your city essentially stood on its own. The cities on your borders were computer controlled, and while you could have limited interactions—such as buying and selling electricity and garbage—you couldn't actually run one of the adjoining cities. Now you can not only be the mayor of multiple cities in your region, you actually *need* other cities to drive growth! Once your first town is thriving, you can create road, rail, electrical, and water connections to an adjoining tile, and load up that new city. Depending on the prosperity of your first city, you might find there's a massive demand for residential or agricultural zones in the new city. By zoning lots of cheap residential areas, putting in well-funded schools, and setting up a few light commercial zones for stores and malls, you'll create suburbs for your original city. Your Sims will even commute from their charming little bedroom communities to high-paying jobs in the metropolis.

The thing we've always enjoyed most about *SimCity* games is just kicking back and watching the rat race. Whether it's health care workers protesting low wages outside a clinic, or tourists snapping photos of the Space Needle, there's always something funny to see in *SimCity 4*. Our favorite slice of Simericana was when we noticed a trampoline surrounded by a large number of kids behind a townhouse in an affluent neighborhood. The next time we returned to the same part of town, every house on the block had a trampoline!

The game also allows you to place specific Sims (which are provided, but can also be imported from *The Sims*) into your cities as "agents." You choose where they live, and they'll report back to you on every aspect of their lives. If your unemployment rate is high, they'll complain about not having a job. If you don't have enough commercial areas zoned, they'll complain that they can't find a good Italian restaurant. What could have been a lame tie-in for another Maxis product ends up being both useful and cool.

Sadly, the game doesn't work right on most ATI Radeon boards, including the Radeon 9700 Pro. Buildings and particle effects drop out whenever you scroll the camera, and Maxis blames the problem on "hardware deficiencies" in the Radeon boards.

SimCity 4 can provide hundreds of hours of fun, thought-provoking gameplay—a terrific execution of a classic game. Now, please excuse us. We've got to get back to building a freeway through the retirement community.

—WILL SMITH

MAXIMUMPC VERDICT

SimCity 4
EA/ MAXIS

+ "DIAMOND" JOE QUIMBY

A deep simulation that provides hours and hours of fun. The graphics are quite impressive and much more varied than previous versions of *SimCity*.

– JEFFERSON DAVIS "BOSS" HOGG

The pesky Radeon problem makes us want to raise taxes, and multiplayer wasn't ready in time for launch.

www.simcity.com
$50
9

Copyrighted material

Become a PC Repair Technician

Earn up to $48,000 a year in an ever-growing field.*

Use your talent for solving your own PC problems to train for a career as a Computer Service Technician or a Technical Analyst. Work at a help desk for a large user community, work for a PC Repair Center, or open your own home repair shop. It's your choice! Consider this: Employment of PC Repair professionals is expected to increase by 14% through 2010 and you can earn as much as $48,000 a year.*

The Education Direct PC Repair Program shows you how to do upgrades, network installations, and more, all in the comfort of your own home. You can:

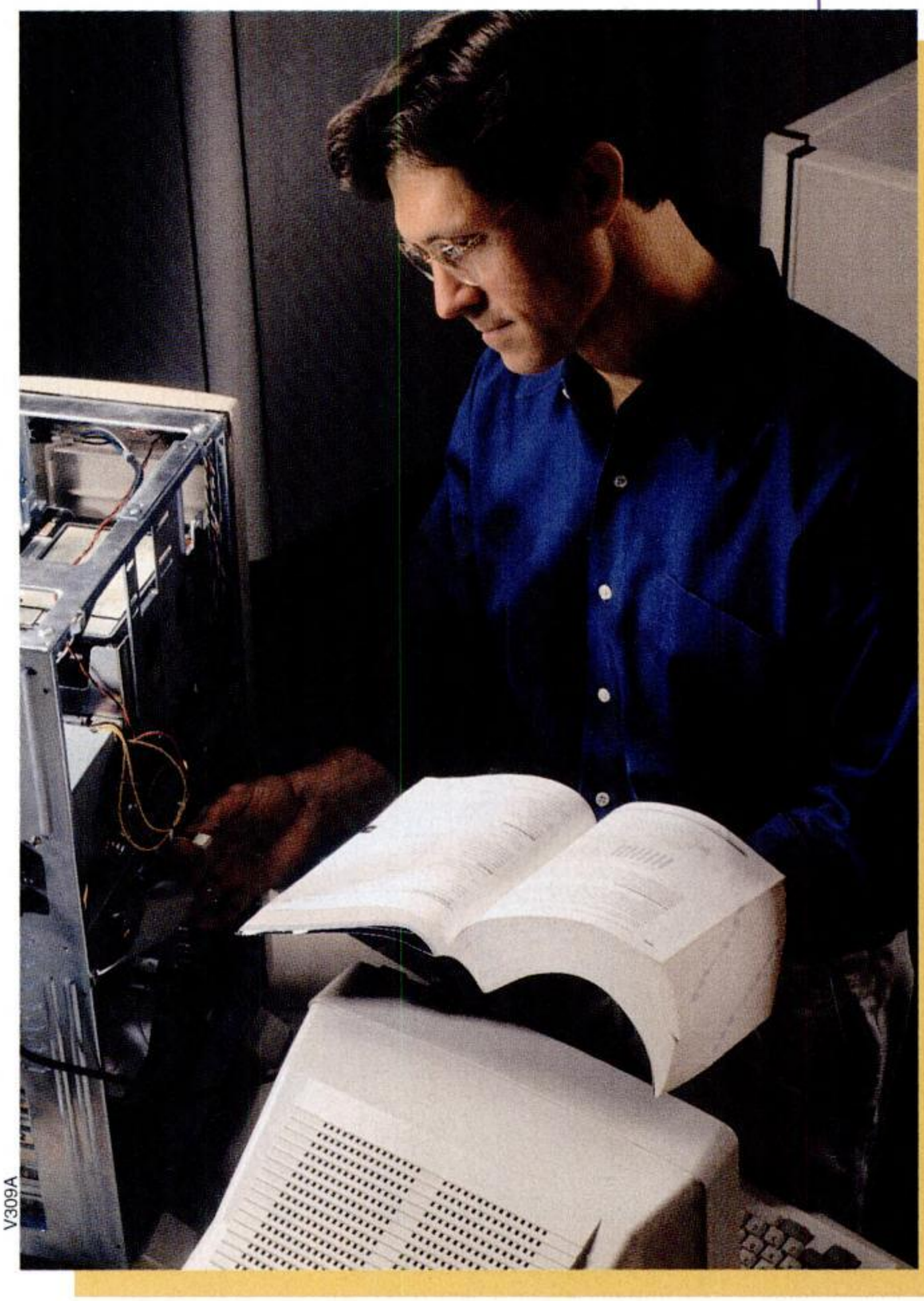
Learn Conveniently - All your lesson materials are delivered directly to your door. Avoid the hassle and expense of commuting. Learn in the privacy of your own space.

Prepare for A+® Certification - Use the complete A+® Certification Test Prep. kit provided with your program to add this valuable credential to your resume.

Build a Prestigious Career - You'll have skills and credentials that employers and coworkers respect. Develop a reputation for success in a field that's filled with advancement opportunity.

Education Direct also offers you other career training programs in computers. Learn Programming or Web Page Design, or get your degree in Applied Computer Science. Choose the direction of your career!

* Growth figures represent a ten-year period ending 2010. Source: *National Industry-Occupation Employment Matrix*, a publication of the U.S. Bureau of Labor Statistics. All salary information is based on the *Occupational Outlook Handbook*, a publication of the U.S. Department of Labor. Individual student earnings vary.



V309A

Here are three easy ways to get FREE information. For fastest service, call TOLL FREE

1-800-572-1607 ext. 1513

Visit **www.EduDirect-usa.com**
Online enter Web ID# PFYS33S

Or complete and return the postpaid card.
(If card is missing, please use the coupon below.)

Yes! Send me free information on how I can train at home for the computer career of my choice. I understand there is no obligation. CHECK ONE BOX ONLY.

☐ **27 PC REPAIR**

Other Computer Programs
- ☐ 38 PC Specialist
- ☐ 43 PC Fundamentals*
- ☐ 44 A+® Certification Test Prep.*
- ☐ 53 Desktop Publishing & Design
- ☐ 83 Web Page Designer

Computer Programming
- ☐ 01 Programming in BASIC
- ☐ 36 Visual C++®
- ☐ 69 COBOL*
- ☐ 82 Java®
- ☐ 37 Visual Basic®

Specialized Associate Degree Programs
- ☐ 64 Applied Computer Science (ASB)
- ☐ 60 Business Management (ASB)
- ☐ 65 Electrical Engineering Technology (AST)
- ☐ 62 Mechanical Engineering Technology (AST)

Career Diploma Programs
- ☐ 390 Bookkeeping
- ☐ 85 Drafting
- ☐ 54 AutoCAD®
- ☐ 06 Electrician
- ☐ 79 Electronics Technician
- ☐ 15 Home Inspector
- ☐ 08 Paralegal

*Certificate Programs

- ☐ 70 Small Business Management
- ☐ 387 Telecommunications Technician
- ☐ 87 TV/VCR Repair

High School Diploma
- ☐ 07 High School

THOMSON
EDUCATION DIRECT™

Dept. PFYS33S
925 Oak Street
Scranton, PA 18515-0700

Name _____ Age _____

Street _____ Apt. # _____

City _____

State _____ Zip _____

Phone ( ) _____

E-mail _____

Copyrighted material

The Sims Online

Great fun—if you're into creeps and tedium

Four years of art school and Thomas still can't cut it as a gnome builder.

So I'm sitting at my computer in a large, warm house filled with a loving family and enough assorted entertainment material to fill a sizable room. On the computer, my current avatar is wearing a purple bunny suit and a death's head. At the moment, he is in a room with several other people. All of them are carving and painting gnomes. This job takes several minutes, after which my little man will sell his gnome for money. Then he'll do a dance, have a buffet meal, bus his plate, and spend more time in the library learning how to be a better gnome-builder. With the money he makes, he can buy a house and stuff it with furniture and appliances, or maybe have a little sex in one of many brothels.

If this resembled an ordinary day in my actual life—if I were in fact a 34-year-old lawn ornament carver who had to pay for sex—I'd open a vein. But in this case, the gnome, money, furniture, house, and sex are all imaginary. For a moment, I thought my unskilled little character was the lamest mini-death-bunny on the face of the earth. Then I realized: At least he didn't pay $49.99 plus $9.99 a month to *pretend* to live a lame life.

Users get three Sims with an account. Each Sim can live in a different region, and receives starting funds of 10,000 simoleans.

At that point, I became so depressed I quit *The Sims Online* and desperately searched the house for some useful task that would rid me of the taint. Ultimately, I settled on organizing my sock drawer. That was infinitely more fulfilling than *The Sims Online*.

There is some weird reverse alchemy at work in *The Sims Online*, with all the gold of *The Sims* transmuted back into base elements. A clever game in which you manipulated environments and people to create a kind of virtual everyday life has become nothing more than the world's most lavish chat room. The pleasure of building is replaced with the dozy drudgery of cooking and jarring preserves. The sly delight of wrecking the life of an imaginary Sim by, say, removing all the toilets from his house is replaced by queasy social pseudo-interaction where you're never quite sure of the ground rules. (Am I me? Am I a character? Is this real chat or game chat? And did that girl proposition me or my Sim? *I'm so confused.)*

Take sex, for instance, which was (strangely and somewhat disturbingly) foremost on my editors' minds when they assigned me this review. I visited a brothel that charged 400 "simoleans" (the coin of the realm) for three minutes. I told the girl (make that "girl," since I was probably talking to a confused young man in Spokane) that, if history was any indicator, I'd probably need only one minute, but there was no discount. I transferred 400 from my starting funds of 10,000 and was greeted by a private pop-up chat window.

By this time I was feeling so skanky and useless that I was going to have to organize my wife's sock drawer and possibly even my neighbor's. I didn't stick around long for the decidedly un-hot hot chat that ensued, but having successfully aided in the creation of two children, I think I know enough about sex to be fairly certain she was suggesting an anatomical impossibility.

And this, alas, is what *Sims Online* is destined to become: perv central. The main culprit is the numbing gameplay, which leads to long hours spent doing nothing in front of a monitor while you either improve skills or build things to earn enough money to ... get totally grossed out by a guy living in his mom's basement. You get so bored you *have* to stir up trouble to create any interest whatsoever. *Sims Online* seems to have hoovered all the enjoying aspects from *The Sims*. Gone are the free-wheeling construction and playful godlike twiddling with a roster of characters. The skill-based tasks involve nothing more than clicking on a library to improve skills (each Sim has ratings for mechanical, cooking, charisma, body, logic, and creativity) and then clicking on a workbench to use those skills in order to make money to furnish a house. It inserts a poorly modeled economic layer between the gamer and the Sim experience to no real purpose.

The Sims was about control and creativity. It moved, you did things, and interesting things happened. *The Sims Online* is about social interaction. It's slow, you do nothing, and the most interesting things that happen are usually appalling.

—THOMAS MCDONALD

MAXIMUM PC VERDICT

Sims Online
EA/MAXIS

+ MAKING WHOOPEE
The ultimate chat room, with colorful visuals, expressive animations, and plenty of people with time to talk.

– MAKING GNOMES
Gameplay is filled with long stretches of doing nothing. The economy is underdeveloped and merely interferes with gameplay.

www.ea.com
$50 plus $10 a month

5

Copyrighted material

Enhance your digital lifestyle.

Upgrade your PC today.

AMD PROCESSORS

ATHLON XP	
Athlon XP 2700+	$345
Athlon XP 2600+	$276
Athlon XP 2400+	$174
Athlon XP 2200+	$151
Athlon XP 2100+	$91
Athlon XP 2000+	$79
Athlon XP 1900+	$73
Athlon XP 1800+	$64
Athlon XP 1700+	$57
ATHLON MP	
Athlon MP 2400+	$213
Athlon MP 2000+	$164
Athlon MP 1900+	$154
AMD DURON	
Duron 1.3 GHz	$39
Duron 1.2 GHz	$34
Duron 1.1 GHz	$29
Duron 950 MHz	$27

INTEL PROCESSORS

PENTIUM 4-Retail Box	
3.06 GHz 533FSB 512K	CALL
2.8 GHz 533FSB 512K	$401
2.66 GHz 533FSB 512K	$298
2.53 GHz 533FSB 512K	$246
2.4B GHz 533FSB 512K	$193
2.26 GHz 533FSB 512K	$204
2.0 GHz 400FSB 512K	$169
1.8A GHz 400FSB 512K	$148
PENTIUM III FCPGA/2	
P-III 1.4 GHz 512k	$215
P-III 1.2 GHz 256k	$114
P-III 1.13 GHz 256k	$116
CELERON FCPGA2/478	
Celeron 2.0GHz s478	$88
Celeron 1.8GHz s478	$74
Celeron 1.7GHz s478	$58
Celeron 1.3GHz s370	$51

COOLING ACCESSORIES

COOLERMASTER	
SocketA & 370	
Jumbo Aluminum Fan	$9
HSC 7k RPM Pure Cu	$19
HHC 7k RPM Cu Pipe	$35
HSC- Low noise Cu Pipe	$35
Univ. 80MM Case	$9
ZALMAN	
CNPS 3100+ SKT A	$28
CNPS 6000-CU SKT A	$39
CNPS 6500B-CU SKT 478	$46
CNPS 57000-CU SKT 478	$41

STORAGE

MAXTOR	
20GB 100/7200/2MB	$67
40GB 133/7200/2MB	$82
60GB 100/5400/2MB	$91
60GB 133/7200/2MB	$92
80GB 100/7200/2MB	$106
120GB 100/5400/2MB	$150
WESTERN DIGITAL	
20GB 100/7200/2MB	$68
40GB 100/7200/2MB	$84
60GB 100/7200/2MB	$92
80GB 100/7200/2MB	$105
120GB 100/7200/2MB	$150
120GB 100/7200/8MB	$174
IBM	
40GB 100/7200/2MB	$86
60GB 100/7200/2MB	$93
80GB 100/7200/2MB	$110
120GB 100/7200/2MB	$160
IOMEGA	
250MB Internal	$69
250MB EXT USB	$134
250MB EXT PAR	$139

CONTROLLERS

TCW PCI ATA133 RAID	$24
PROMISE	
PCI ATA133	$35
PCI ATA133 RAID	$92

DRIVE COOLING

PCI Slot System	$7
3.5" SGL FAN HDD	$12
5.25" DUAL FAN HDD	$20
Coolermaster Alum HDD	$30

CASES

Midtower 350w Black	$69
Enlight Mid 7237 USB	$67
FullTower 300w	$77
Aluminum w/Window	$191
Blk Aluminum w/Window	$191
ANTEC	
PLUS660AMG 330W Mini	$104
SX630II 300W Mini-Tower	$73
SX1040BII 400W File Server	$96
SLK3700AMB 350W	$96
CASE ACCESSORIES	
80MM fan guard	$3
6pk Case thumbscrews	$4
Blue Cold Cathode	$19
Green Cold Cathode	$19

CD-RW

32x10x40 Samsung w/DVD	$87
32x12x40 Mitsumi BLK	$57
48x24x48 Lite-On BLK	$71
48x24x48 Lite-On	$59
48x16x48 MSI Retail	$58

DVD R/RW

PIONEER	
DVR-A04	$322
DVD R Media 5 Pack	$25

CD ROMS

54X Mitsumi	$23
52X Asus	$25
52X Creative Labs	$29
52X Lite-On	$23

DVD ROMS

16X Samsung	$46
16X Toshiba	$46
16X Lite-On	$45
16X Lite-On Black	$46

$6.95 Shipping on all items!

****on all orders up to 150-lbs**

WIRELESS NETWORKING

LINKSYS	
WIFI USB LAN Adapter	$62
PCMCIA WIFI Adapter v2.5	$69
PCI WIFI Adapter	$91
WIFI PCMCIA -> PCI ADAP	$44
WIFI Access Point	$109
Cable/DSL Router	$128

NETWORKING

SWITCHES/HUBS	
8port 10Mb	$27
8port 10/100 Switch	$50
16port 10/100 Switch	$80
Linksys Cable/DSL Rout.	$73
NETWORK ADAPTERS	
TCW Realtek 10/100	$10
3Com 10/100	$32
Intel Pro 10/100	$33
Intel Pro/1000MT	$41
CABLE/DSL ROUTERS	
Linksys 4 Port Router	$73
Belkin4 Port Router	$71

MONITORS

17"	
AOC 7ELR .23hdp	$145
AOC 7F .21hdp Flat	$157
AOC 7E-BLK .23hdp	$153
AOC 7F-SLK .23hdp	$171
19"	
AOC 9GLR .21 mdp	$189
LCD Displays	
AOC 15" LM520	$339
AOC 17" LM720	$471
Cornea 15" CT1501 BLK	$371
Cornea 17" MP704 BLK	$509
Cornea 17" CT1700	$461
Cornea 18" CT1810	$630

All with Three Year Warranty!

USB

64MB USB Thumb Drive	$40
128MB USB Thumb Drive	$64
USB 2.0 5port PCI Card	$24
USB 2.0 4port HUB	$36
USB 2.0 EXT IDE Encl.	$76
USB 2.0 A-to-B cable 6ft	$5

VIDEO CARDS

TCW - NVIDIA	
Geforce4 Ti4600 128MB 8X	$325
GeForce4 Ti4200 128MB	$160
TCW - ATI Powered	
RADEON	
9000 64mb DDR	$83
9000 Pro 128mb DDR	$135
9700 Pro 128mb DDR	$379
MSI	
TV Anywhere	$56
GeForce 4 Ti 4200	$144
ATI - Built by ATI	
AIW 8500DV 64MB	$191
MATROX	
Millennium G550 32MB	$97
Parhelia 128MB OEM	CALL

MEMORY

DDR	
256MB PC2100	$51
512MB PC2100	$103
256MB PC2100 REG	$79
512MB PC2100 REG	$139
1.0GB PC2100 REG	$349
256MB PC2700	$57
512MB PC2700	$114
256MB PC3200	$66
512MB PC3200	$131
SDRAM	
64MB PC100	$21
128MB PC100	$27
256MB PC100	$50
64MB PC133	$18
128MB PC133	$27
256MB PC133	$39
512MB PC133	$77
256MB REG NON-ECC	$64
256MB REG ECC	$67
512MB REG NON-ECC	$85
512MB REG ECC	$93
RAMBUS	
128MB PC800 NON-ECC	$37
256MB PC800 NON-ECC	$74
128MB PC800 ECC	$50
256MB PC800 ECC	$96
512MB PC800 ECC	$240
256MB PC1066 16bit	$100
256MB PC1066 32bit	$99

LIFETIME WARRANTY

CAMERAS

LOGITECH	
Pocket Digital Camera	$102
Quickcam Express	$45
Quickcam Pro 4000	$87

MOTHERBOARDS

PENTIUM4 / CELERON	
GIGABYTE	
GA-8IE533 i845E DDR	$96
GA-8IHXP2 i850E 533F RDR	$172
GA-8GE667PRO i845GEDDR	$133
GA-85R533P SiS648 DDR	$99
GA-8INXP i7205 DUAL DDR	$263
ASUS	
P4B533E i845E 533FS DDR	$164
ATHLON / DURON	
EPOX	
8RDA+ NVIDIA nForce2 DDR	$108
GIGABYTE	
GA-VAX KT333 DDR	$90
GA-VAXP KT333 DDR	$114
MICROSTAR	
MSI K7N2G-L NVIDIA nForce2 DDR	$126
MSI KT4 ULTRA SR	$121
MSI KT4 ULTRA	$103
MSI KT3 ULTRA2-R	$104
MSI KT3 ULTRA2	$78
MICROSTAR DUAL SCKTA	
K7D MASTER A760MPX	$212
ASUS	
A7S333 SiS DDR	$71
A7V333R KT333 DDR	$141
A7V8X KT400 DDR	$142
A7N8X NFORCE2 DDR	$161
ASUS DUAL SCKTA	
A7M266D A760MPX	$223

SOUND CARDS

CREATIVE LABS	
Audigy MP3 5.1	$89
Audigy X-Gamer 5.1	$89
Audigy 2	$118
Audigy2 Platinum	$182
Extigy	$140

ACCESSORIES

MICROSOFT	
Intellimouse Optical	$24
Natural Multimedia Keyboard	$29
Office Keyboard	$29
Wireless Desktop Combo	$39
LOGITECH	
Cordless Elite Duo Mouse/Keyboard	$81
Cordless Navigator Duo Mouse/Keyboard	$66
MX 500 Optical MSE	$44
MX 700 Wireless Optical MSE	$70

MSI K7N2G-L DDR Mainboard

featuring the NVIDIA nForce™ 2

Presenting the King of the Gaming World - MSI K7N2G-L. This high performance NVIDIA nForce2 platform is equipped with powerful NVIDIA® GeForce™ 4 MX Graphics, NVIDIA nForce2's advanced Dual Channel DDR support, and many more outstanding features!

Contact TCWO.com today to unleash the power of Your Ultimate Digital Experience!

$126

TCWO.com

Visit us on the web at www.tcwo.com or Call Toll-Free: 800.941.2750

Sales Hours : Mon-Fri 9AM-7PM EST Sales and Customer Service : 800.941.2750

Price, specification, and terms are subject to change without notice, Thompson's Computer Warehouse is not responsible for errors in typography and/or photography.

Copyrighted material

HardDrive.com

Your Storage Resource

We are the largest source for Color Components

We stock thousands of Computer Products

Gigabyte GA8INXP

P4 E7205 Chipset
Dual Channel DDR
AGP 8X, Serial ATA
ATA 133 Raid
6 Channel Audio

$239

Sony DRU500AX DVD+RW/CD-RW

4x DVD-R
2x DVD-RW
24x CD-R
10x CD-RW

$325

CRU Dataport IIE

Plastic Carrier
Plastic Frame
Supports 3.5" hard drives
IDE Ultra ATA-133
One Year Warranty
Power/Drive Activity LEDs
Key Lock ON/OFF security

$15

Sales Line: 800-400-3499

Serial ATA

SEAGATE

80GB	7200rpm	Serial ATA	ST380023AS	$155
120GB	7200rpm	Serial ATA	ST3120023AS	$195
160GB	7200rpm	Serial ATA	ST3160023AS	$295

MAXTOR

60GB	7200rpm	Serial ATA	6Y060MO	$134
80GB	7200rpm	Serial ATA	6Y080MO	$150
120GB	7200rpm	Serial ATA	6Y120MO	$218
160GB	7200rpm	Serial ATA	6Y160MO	$300
200GB	7200rpm	Serial ATA	6Y200MO	$376

Serial Controller

3Ware	Escalade 8500-4 ATA 150 Raid	$369
3Ware	Escalade 8500-8 ATA 150 Raid	$519
3Ware	Escalade 8500-12 ATA 150 Raid	$789

Serial Accessories

3Ware	Parallel to Serial ATA Coverter	$39
MicroAcces	15Pin To 4Pin Male Power Cable	$10

Serial Accessories

3Ware	RDC 300 Raid Drive Cage 3 HS	$189

IDE Hard Drives

MAXTOR

30GB	7200rpm	ATA 133	6E030L0	$77
40GB	7200rpm	ATA 133	6E040L0	$87
60GB	7200rpm	ATA 133	6Y060L0	$96
80GB	7200rpm	ATA 133	6Y080L0	$111
120GB	7200rpm	ATA 133	6Y120L0	$155
160GB	7200rpm	ATA 133	6Y160P0	$258
200GB	7200rpm	ATA 133	6Y200PO	$328
250GB	5400rpm	ATA 133	4A250J0	★ $385
250GB	7200rpm	ATA 133	6Y250PO	$407

SEAGATE

20GB	5400rpm	ST320014A	$64
40GB	7200rpm	ST340016A	$84
60GB	7200rpm	ST360021A	$98
80GB	7200rpm	ST380021A	$112
120GB	7200rpm	ST3120023A	$162

I B M

60GB	7200rpm	07N9212	★ $94
80GB	7200rpm	07N9685	$111
120GB	7200rpm	07N9214	$158
180GB	7200rpm	07N9216	$284

SAMSUNG

40GB	5400rpm	SV4012H	$82
60GB	7200rpm	SV0602H	★ $90
60GB	5400rpm	SV6003H	$98
80GB	7200rpm	SP8004H	$110
120GB	5400rpm	SV1204H	$141

Western Digital

40GB	7200rpm	WD400BB	★ $84
60GB	7200rpm	WD600BB	$102
80GB	7200rpm	WD800BB	$111
80GB	7200rpm	WD800JB	$120
120GB	7200rpm	WD1200JB	$179
180GB	7200rpm	WD1800BB	$277
180GB	7200rpm	WD1800JB	★ $300
180GB	7200rpm	WD1800JB	$310
200GB	7200rpm	WD2000BB	$311
200GB	7200rpm	WD2000JB	$332

2.5" IDE for Laptops

20GB	Toshiba	9.5mm	4200rpm	HDD2168	★ $93
20GB	IBM	9.5mm	5400rpm	07N9481	$103
20GB	Hitachi	9.5mm	4200rpm	DK23DA20F	$96
30GB	IBM	9.5mm	4200rpm	07N8326	$135
30GB	Hitachi	9.5mm	4200rpm	DK23DA30F	$129
40GB	Hitachi	9.5mm	4200rpm	DK23DA40F	$140
40GB	IBM	9.5mm	5400rpm	07N9482	$155
40GB	Toshiba	9.5mm	4200rpm	HDD2170	★ $131
60GB	Toshiba	9.5mm	5400rpm	HDD2183	$196

Iomega NAS

NAS	A300U 120GB	$999
NAS	P400U 160GB	$1790
NAS	P400M 160GB	$1999
NAS	P405U 320GB	$2499
NAS	P405M 320GB	$3069
NAS	P410U 480GB	$3150
NAS	P410M 480GB	$4049
NAS	P415U 720GB	$4339
NAS	P415M 720GB	$5218
NAS	P415M SCSI 720GB	$5070

Prices reflect instant rebate

MPC0303

★ Awesome Deal!

SCSI Hard Drives

MAXTOR

18.4GB	10K	Ultra160	KW018L2	★ 8mb	$134
18.4GB	10K	Ultra320	KU018L2	8mb	$176
36.7GB	10K	Ultra160	KW036L4	8mb	$207
36.7GB	10K	Ultra320	KU036L4	8mb	$266
73.4GB	10K	Ultra160	KW073L8	8mb	$493
73.4GB	10K	Ultra320	KU073L8	8mb	$532

SEAGATE

18.4GB	15K	Ultra320	ST318432LW	★ 8mb	$226
36.7GB	10K	Ultra320	ST336607LW	8mb	$231
36.7GB	15K	Ultra320	ST336753LW	8mb	$237
36.7GB	15K	Ultra320	ST336732LW	8mb	$337
73.4GB	10K	Ultra320	ST373307LW	8mb	$525
146.8GB	10K	Ultra320	ST3146807LW	8mb	$1019

I B M

18.4GB	15K	Ultra160	07N6800	★ 4mb	$214
36.7GB	10K	Ultra160	07N6340	4mb	$218
36.7GB	15K	Ultra160	07N6801	4mb	$334
36.7GB	10K	Ultra320	08K0342	8mb	$245
73.4GB	10K	Ultra320	08K0332	8mb	$502
146GB	10K	Ultra320	08K0322	8mb	$998

Hitachi

18.4GB	10,000rpm	DK32DJ-18MW	4mb	$167
36.9GB	10,000rpm	DK32DJ-36MW	4mb	$246
73.9GB	10,000rpm	DK32DJ-72MW	4mb	$514

External SCSI

Make any SCSI HardDrive External with External Encloseres from $99

1 Bay SCSI Case	$99
2 Bay SCSI Case	$129
4 Bay 50pin Case	$229
1 Bay Ultra 160 Case	$119
2 Bay Ultra 160 Case	$159

Controller Cards

SCSI Controllers

Adaptec	RAID 2000S	$225	19160 Kit	$219
Adaptec	RAID 2005S	$224	29160 Kit	$295
Adaptec	RAID 3210S	$654	29160N Kit	$279
Adaptec	RAID 3400S	$814	39160 Kit	$340

IDE Controllers

Adaptec	ATA RAID 1200A Kit	$65
Adaptec	ATA RAID 2400A Kit	$320
Promise	ATA133 Card ULTRA133TX2	$49
Promise	ATA100 2ch RAID FASTTRAK100TX2	$87
Promise	ATA133 2ch RAID FASTTRAKTX2000	$100
3Ware	ATA133 2ch Raid 32bit 7000-2	$115
3Ware	ATA133 4ch Raid 64bit 7500-4	$299
3Ware	ATA133 8ch Raid 64bit 7500-8	$429
3Ware	ATA133 12ch Raid 64bit 7000-12	$699

Firewire Controllers

Adaptec	1394/Firewire CardBus Kit	$79
Orange Micro	Firewire 3 Port PCI Card	$48

USB Controllers

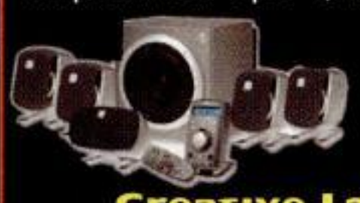
Adaptec	USB 2.0 2-port CardBus Kit	$65
Orange Micro	USB 2.0 4 Port PCI Card	$47

BOOMS Speakers

Klipsch

Klipsch	5.1	6pc	$399
Klipsch	4.2	6pc	$299
Klipsch	4.1	5pc	$249
Klipsch	2.1	3pc	$179

Logitech



Z540	4.1	40W	$59
Z640	5.1	51W	$70
Z560	4.1	400W	$145
Z680	5.1	480W	$288

Creative Labs

Inspire4400	5pc	41W	$55
Inspire5300	6pc	48W	$71
Inspire5700	6pc	79W	$241

Altec Lansing

641	5pc	400W	$145
ATP4	5pc	80W	$108
AL2100	3pc	40W	$75

CDRW/DVD Drives

CDRW Drives			Beige	Color
24x10x40	IDE	Pacific Digital U-30106	★ $45	$60
32x12x40	IDE	Pacific Digital U-30119	★ $50	$65
40x12x40	IDE	Plextor PXW4012TA/SW	$108	$123
40x12x48	IDE	Teac CDW540E/KIT	$79	$94
40x16x48	IDE	Pacific Digital U-30133	$60	$75
44x24x44	IDE	Yamaha CRW-F1ZE	$116	$131
48x12x48	IDE	Pacific Digital U-30127	$80	$95
48x16x48	IDE	BenQ 4816P	$62	$77
48x24x48	IDE	Samsung SW248FRAS	$57	$72
48x24x48	IDE	Lite-On LTR48246S	$57	$72
48x24x48	IDE	Plextor PXW4824TA/SW	$110	$125
48x24x48	IDE	Plextor PX320ASW	$145	$170
52x24x48	IDE	TDK AI-5200	$93	$108
52x24x52	IDE	Lite-On LTR5224	★ $68	$83
52x24x52	IDE	BenQ 5224P	$68	$83
52x24x52	IDE	Pacific Digital U-30146	$80	$95
52x24x52	IDE	Sony CRX220A1	$84	$99
12x10x32	SCSI	Plextor PXW1210TS/SW	$215	$230
44x24x44	SCSI	Yamaha CRW-F1ZS F-Cav	$233	$248

DVD Drives

16x/48x	IDE	Toshiba SDM1612TA	$75	$90
16x/40x	IDE	Pacific Digital U-30115	$59	$74
16x/40x	IDE	Pioneer DVD Tray DVD119	$49	$64
16x/40x	IDE	Pioneer DVD Slot DVD106	$69	$84
16x/40x	IDE	BenQ DVD1648A	$80	$95
10x/40x	SCSI	Pioneer DVD305S	$104	$119

CD-ROM Drives

52x	IDE	Lite-On LTN525	★ $35	$50
52x	IDE	Creative Labs BLASTER52X	$35	$50

USB/Firewire Drives

USB2.0 Hard Drives

Buslink	40GB	7200rpm	UII-4072E	$172
Buslink	60GB	7200rpm	UII-6072E	$190
Maxtor	80GB	5200rpm	V01J080	$198
Buslink	100GB	7200rpm	UII-1007E	$285
Iomega	120GB	7200rpm	32394	$249

USB Removable Drives

Iomega	100MB Zip Ext USB Drive 31714	★	$74
Iomega	250MB Zip Ext USB Drive 31310		$112
Iomega	750MB Zip Ext USB Drive 32324		$146

USB CDRW Drives

Lite-On	LXR40122 40x12x40 2.0 CD-RW	$114
Iomega	32497 48x24x48 2.0 CD-RW Drive Kit	$143
Pacific	Digital U-30125 32x12x48 USB 2.0 CD-RW Kit	$120
Pacific	Digital U-30128 48x12x48 USB 2.0 CD-RW Kit	$150
Sony	CRX2100U 48x12x48 2.0 CD-RW Drive Kit	$142
Plextor	PXW4824TUSW 48x24x48 USB 2.0 CD-RW Kit	$165

USB DVD/CDRW Combo

Sony	USB 2.0 24x10x24/8x	CRXP90MU	$232

Firewire Hard Drives

Buslink	60GB	7200rpm	FW6072E	$190
Buslink	80GB	7200rpm	FW8072E	★ $237
Buslink	100GB	7200rpm	FW10072E	$285
Buslink	120GB	7200rpm	FW12072E	$313
Iomega	80GB	7200rpm	32387	$228
Iomega	120GB	7200rpm	32395	$294

Firewire CDRW Drives

Buslink	48x12x48	RW-4848FE	★ $150
Yamaha	44x24x44	CRW-F1ZDX	$259

Firewire DVD Drives

Addonics	8X DVD/24X	DVD8X24FW	$250
HP	DVD+RW/CDRW	823140	$388

Firewire Removable Media Drives

Iomega	Zip 750MB	32450	$164
Iomega	Peerless w/10GB Disk	31767	$102
Iomega	Peerless w/20GB Disk	31768	$130

Copyrighted material

Processors

INTEL

Xeon	1.8GHz 512 cache	$194
Xeon	2GHz 512 cache	$228
Xeon	2.4GHz 512 cache	$265
Xeon	2.8GHz 512 cache	$376
P4	2.26GHz 512k 533	$215
P4	2.4GHz 512k 533	$216
P4	2.53GHz 512k 533	$269
P4	2.6GHz 512k 400	$336
P4	2.66GHz 512k 533	$336
P4	2.8GHz 512k 533	$437
P4	3.0GHz 512k 533	$685

INTEL Cooling

Thermaltake DRAGON ORB $28

Cooler Master IHC-H71 $29

Zalman CNPS6500ALCU $24

AMD

1.3GHZ Duron	$57
Athlon XP2000+	$93
Athlon XP2200+	$169
Athlon XP2400+	$200
Athlon XP2600+	$309
Athlon XP2700+	$359
Athlon XP2800+	$399

Test — We Will Test Any CPU/Motherboard Combo $15

AMD Cooling

Thermaltake Volcano 9 $28

Cooler Master HCC-L61 $29

Zalman CNPS3100P $24

Arctic Silver III 99.8% pure micronized silver compound $6

Motherboards

SOCKET A Call for a great deals on a processors!!

Asus	A7V8XLAN	$119	A7V8XLFWSR	$133
	A7V333AU2	$104	A7V333ARU2F	$136
	A7N8X DualDDR	$121	A7N8XD DualDDR	$145
Iwill	XP333	$75	MPX2	$198
	KK400	$95	XP333	$77
MSI	K7N2-L	$101	KT4ULTRA-FISR	$140
	K7N2G-L	$124	KT4ULTRASR	$118
	SOCKET 478 (Pentium 4)			
Asus	P4G8X DualDDR	$259	P4S8X DualDDR	$135
	P4B533VLAN	$148	P4T533	$171
	P4T533-C/LAN	$164	P4B266-C	$96
	P4PELANVAY	$127	P4PELFWSR	$148
Gigabyte	GA8INXP DualDDR	$239	GA8PE667U	$138
	GA8IHXP2	$169	GA8GE667PRO	$119
	GA5INXP DualDDR	$299	GA8IR533 ★	$85
Iwill	MP4GL	$92	MP4G	$108
	P4E	$112	P4R533N	$109
	P4G	$109	P4GS	$112
MSI	845PEMAX	$90	E7205MASTERL	$197
	845PEMAX2-FIR	$152	845GVM-L	$77
Intel	BOXD845BGL	$120	D845HV	$96
	D845GEBV2L	$125	845PEBT2	$99

PC Mods

Window Kits

Sunon Fans

80mm	$13
92mm	$17
120mm	$21

80 mm LED Fans Available in Blue, Green, Red and Tri Colored $13

Grills

80mm	$18
92mm	$20
120mm	$24

Rectangle $19
Round $25
Oval $25
L-Shaped $30

We can install any window into a case you buy from us for $35

Neons

Neon Accents From $24
Blue, Green, Red, Black

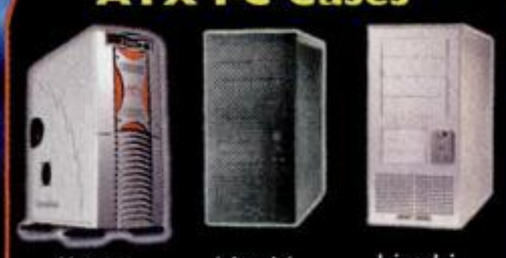
Neon Power Adapter $2
standard power connector

Window Etchings

Bio-Hazard Etched Applique	$12
Atomic Etched Applique	$8
Radio Active Etched Applique	$8

Cases

ATX PC Cases



Xaser 6000 Plus $179

LianLi PC-61 USB $139

LianLi PC-62 USB $134

Xaser III V2000A $225

Xaser III V1000D $179

Xaser III V1000A $179

Global Win GAT001 $179

Coolor Master $329

HDC MX-01GND-S $169

Koolance Black $329

Koolance White $329

Koolance Blue $299

See More Of Cameron's Specials At www.harddrive.com/cameron

Special $145

Aluminum ATX Cases with 420watt P4/AMD power supply, 4 80mm Multi Color LED fans, and full side window.

Video Cards

ATI

100-433001	RADEON 9000P 64MB	$118
100-434102	RADEON 9500P 128MB	$204
100-434003	RADEON 9700P 128MB	$359
100-710002	AIW RADEON 8500DV 64MB	$180
100-710030	AIW RADEON 8500 128MB	$270
100-434003	AIW RADEON 9700P 128MB	$405

EVGA

064A8NV74S1	GEFORCE4 MX440 8X w/ TV Out ★	$76
128A8NV79T1	GEFORCE4 TI4200 128MB 8X AGP	$175
128A8NV84T3	GEFORCE4 TI4600 128MB 8X AGP	$272

Gainward

ULTRA6508X	GEFORCE4 TI4200 128MB DDR	$195
VG4TI42DTF	GEFORCE4 TV/DVI 64MB	$150
ULTRA 650GXP	GEFORCE4 TI4400 128MB DDR VC	$177

PNY

VCQ4580XGBLK	Quadro4 580 XLG 64MB 8X AGP	$258
VCQ4750XGLBLK	Quadro4 750 XLG 128MB 4X AGP	$331
VCQ4900XGLBLK	Quadro4 900 XLG 128MB 4X AGP	$506
VCQ4950XGLBLK	Quadro4 950 XLG 128MB 8X AGP	$550

BFG

ASLM420064	GEFORCE4 TI4200 64MB Asylum	$154
ASLM440AGP	GEFORCE4 MX440SE AGP Asylum ★	$90
ASLMTI4200	GEFORCE4 TI4200 128MB AGP Asylum	$180
ASLMTI4600	GEFORCE4 TI4600 128MB Asylum	$270

MSI

VTD8X	GEFORCE4 TI4200 128MB DDR 8X VIVO	$178
TD8X64	GEFORCE4 TI4200 64MB DDR 8X AGP	$148
VT8X128	GEFORCE4 MX440 128MB DDR 8X AGP	$115
TD8X	GEFORCE4 TI4600 128MB DDR 8X AGP	$315
TI4800SE-TD8X	GEFORCE4 TI4800 128MB DDR 8X AGP	$Call

Enermax

www.harddrive.com/enermax

Enermax 5190AL-001 $319	Enermax 3171L-S3A $81	Enermax 3071-S3A $81	Enermax 5190AL-061 $319

Dual Fan P4 Ready

300 Watt EG301P-VE	$47
350 Watt EG365P-VE	$55
430 Watt EG465P-VE	$84
550 Watt EG651P-VE	$155

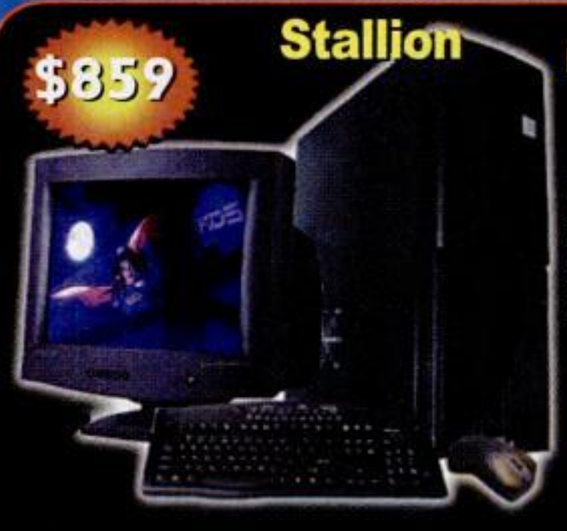
Dual Wisper Fan P4 Ready

350 Watt 365P-VE	$64

SoHo System

Stallion

$859



Save BIG on Quantity Purchases

1-4	$859
5-10	$799
11-25	$760
26-50	$720
50-100	$715

AMD Athlon XP

Hydraulic ATX Case w/ 300 Watt Power Supply P4 Ready
Matsonic Socket A ATA/100 4X AGP Motherboard
AthlonXP Model 6 2000 + 1.67GHz PIB Processor
40GB 7200rpm 2MB Cache Hard Drive
64bit 128-bit 2D/3D 100MHz Host interface Video
Digital Audio
2 USB Ports, 1 Game Port
Black 52X24X52 CDRW Drive
Black 16X/40X Pioneer DVD Rom Drive
Black 1.44 MB Mitsumi Floppy
56K Modem
10/100Mbps Fast Ethernet Lan
Black Keyboard, Mouse, Speaker Combo
Windows XP Home
17" CRT FST Monitor 1280 X 1024
Built by KickAssGaming PC Certified Technicians
FREE Lifetime Technical Support

Add Z680 Speakers $288

Video Editing

Raptor DV1000

Includes JD-1 Digital Editing Joystick

Cooler Master 101B Aluminum Case w/ Window
SuperMicro 400w Dual Xeon Power Supply
SuperMicro X5DAE Dual Xeon 8X AGP, 64bit PCI Motherboard
Intel Pentium 4 2.8 Dual Xeon Processors
3 Ware Escalade 4Port Serial ATA 150MB/sec RAID Card
2 Seagate 120GB Serial ATA 150 Mbytes/sec, Raid 0
ATI Radeon 9700 Pro 128MB Video Card
3GB PC-2100 DDR Memory
Silver Sound Blaster Audigy 2 Platinum w/ Live Drive
Silver Sony DRU500AX DVD-/+R,CDR/RW Drive
Silver Sony 16X/40X DVD Rom Drive
Siver Iomega 750MB Zip Drive, Silver Floppy Drive
Silver Rounded cables, Red Hot Pluggable SATA Cables
Windows XP Professional
Canopus JD-1 Digital Editing Joystick
DVStorm2 Imagination Bundle, Includes DVS2, Storm Bay, Imaginate, Photo Album, Xplode Pro, & Premier 6.5
Built by KickAssGaming PC Certified Technicians
FREE Lifetime Technical Support

$7299

Sound Cards

Creative Labs Audigy 2 Platinum is also available in Black, Silver, Blue, Yellow & Green
Audigy 2 Platinum Black Bezel $19

Creative Labs

Creative Labs	Audigy X Gamer	$89
Creative Labs	Audigy MP3	$89
Creative Labs	Audigy 2	$115
Creative Labs	Audigy 2 Platinum	$180
Creative Labs	Audigy 2 Platinum Ex	$239

Creative Labs Sound Blaster Extigy USB External Sound Card With Remote. $133

Sales Line: 800-400-3499 www.HardDrive.com

ThorTek Corp. 2800a West Main St League City ,Texas 77573 Lifetime FREE technical support.

Prices & Specs subject to change without notice. Shipping charges are non refundable. Returns may be subject to restocking fee.
Products are covered by manufacturers warranty only. We accept all Government PO's. Local calls 281.557.8336 Fax 281.557.1426

MPC0303

Copyrighted material

Can your game PC do 18500+ 3D mark out of box?

超频

OC System

WWW.OCSYSTEM.NET
1-877-785-3285

Introducing Gaming Power from *Beyond* the Future

3.6+ Gig. of *Hyper Threading* Hertz by
Overcolcked intel Pentium 4 Processor

3500MB/s Memory Bandwidth
Resulting from lightening fast GeIL PC3500 DDR433 RAM Modules

Super Natural Video & Graphice Subsystem
Supercharged by OCS Enhanced Radeon 9700 Pro
with 400MHz Core and 700MHz DDR RAM Speed

Personalized Chasis with High Tech Color
and Glossy Warped in exclusive OCS Liquid Diamond finish

and .... AIR COOLED!
NO WATER NEEDED!!

Over Clocked AMD Systems Available!

EXTREME POWER
overclocking system

Genghis Khan 18500+ 3D Mark*
- Overclocked P4 3.68GHz 640MHz FSB Hyper Threadeing
- Swiftech MCX4000-T Thermal Electric CPU Cooler with Thermaltake Smart Fan II
- Intel 845PE Chipset Motherboard with RAID
- GeIL 512MB PC3700 DDR466 Platinum
- OCS Liquid Diamond Custom Color gTower Aluminum Case
- Vantec Stealth 520w Triple Fan Aluminum Power Supply
- OCS Enhanced ATI 9700 Pro Level II
  128MB DDR 400MHz Core / 700MHz Memory
- 180GB Serial ATA V HDD 8MB Cache
- Color Plextor 48x CDRW
- Color Pioneer A05 DVD-RW Drive
- Sound Blaster Audigy 2 Platinum
- Logitech Z680 THX 5.1 Speaker
- Intel Pro100s Network Adaptor
- Digital Doc5 Thermal Management System
- Logitech Elite Gaming Keyboard / MX300 Mouse
- Microsoft Windows XP Professional

$4099

Mighty Warlock 17300+ 3D Mark*
- Overclocked P4 3.20GHz 640MHz FSB
- Swiftech MCX4000 CPU Cooler with Thermaltake Smart Fan II
- Intel 845PE Chipset Motherboard
- GeIL 512MB PC3500 DDR433 Platinum
- OCS Diamond Warp OC Proved Tower Case
- Thermaltake 420w Dual Fan Power Supply
- OCS Enhanced Radeon 9700 Pro Level II
  128MB DDR 400MHz Core / 700MHz Memory
- Western Digital 120GB Ultra IDE HDD 8MB Cache
- Color 52x CDRW / 16x DVD Drive
- Sound Blaster Audigy 2
- Altec Lansing XA3051 5.1 Speaker System
- Intel Pro100s Network Adaptor
- Fan Control Thermal Management System
- Logitech Elite Gaming Keyboard / MX300 Mouse
- Microsoft Windows XP Home

$2399

Mini Me Game Cube 13200+ 3D Mark*
- Overclocked P4 2.85GHz 600MHz FSB
- Shuttle SB51G Aluminum Cube (Silver or Black)
  (Custom Color Option Available)
- 250w Power Supply
- Intel 845GE Chipset Motherboard
- GeIL 512MB PC3200 DDR400
- OCS Enhanced Radeon 9500 Pro
  128MB DDR 340MHz Core / 670MHz Memory
- Western Digital 80GB Ultra IDE HDD 8MB Cache
- Color 48x16x CDRW/DVD Drive
- Onboard 5.1 Sound
- Onboard 10/100 Network Adaptor
- Microsoft Multimedita Keyboard
- Microsoft IntelliMouse Explorer 3.0
- Microsoft Windows XP Home

$1499

*3D Mark 2001SE 1024 x 768 32bit 32bit 72hz +-2% **Specifications and price are subject to change without notice.

All Systems carries 1 year parts and labor warranty www.OCSystem.net Division of Encore Innovation 14656 East Valley Bl City of Indusry CA 91746 1 877 785 3285

Copyrighted material

CYBERGUYS!

Your Source for Hard-to-Find Computer Parts & Accessories!

Call: 1-800-892-1010

CD Carousel Finds Any Disk in 3½ Seconds!

Bring order to the chaos of your disk collection with the CD Carousel Library.

Can be used standalone or with a PC

Game disks, CDs, VCDs, DVDs, CD-Rs, CD-RWs... up to 150 disks can be managed in this ingenious carousel. Attach it to your PC (via USB port) and you can build a searchable database of your disks then find them by title or keyword. Double-click the title you want from the search results and it is delivered to you in seconds. Up to 127 carousels can be accessed from a single database.

Select disks manually with the convenient pushbutton dial, or create a searchable database with the included software and select titles from your search results by simply double-clicking. The carousel tray rotates and brings requested disks to the front in seconds, partially ejecting them for easy removal and replacement.

To order call 800-892-1010 or online at www.cyberguys.com/mpc0303 134 1360 $99.95

Keep Your Lap *and* Your Laptop Cool with the EZ-Lap™

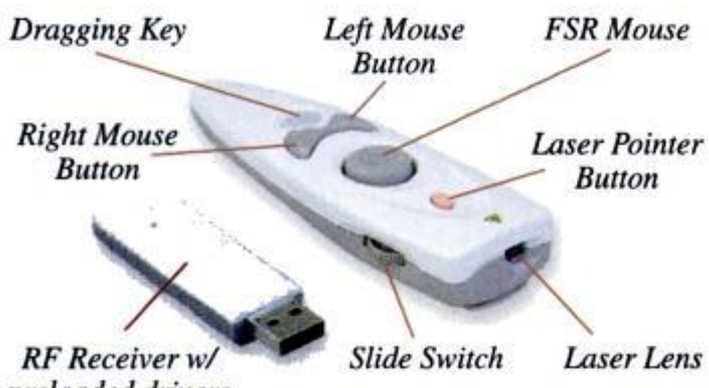
Warm air vents out and away from you keeping you and your laptop cooler.

The EZLap™ raises your computer up about 3/4" and provides just enough space for air to circulate underneath, keeping it and you cooler.

The EZLap™ is lightweight with non-slip/non-scratch pads on top and bottom. Actually use your laptop on your lap, without that uncomfortable hot feeling.

To order call 800-892-1010 or online at www.cyberguys.com/mpc0303 141 0367 $9.95

Wireless USB Presentation Remote Control w/Laser Pointer



Plug the tiny receiver into a USB port and you have an RF, 2-button mouse w/laser pointer & 33ft. range!

- CR2032 battery lasts up to one year
- MS serial, PS/2 2-button standard

Ideal for PowerPoint presentations

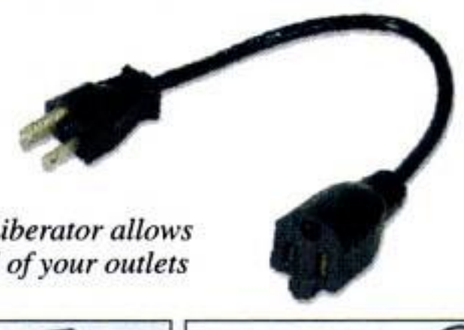
To order call 800-892-1010 or online at www.cyberguys.com/pcm0303 142 0130 $59.95

General Purpose 4.7GB DVD-R in Jewel Case

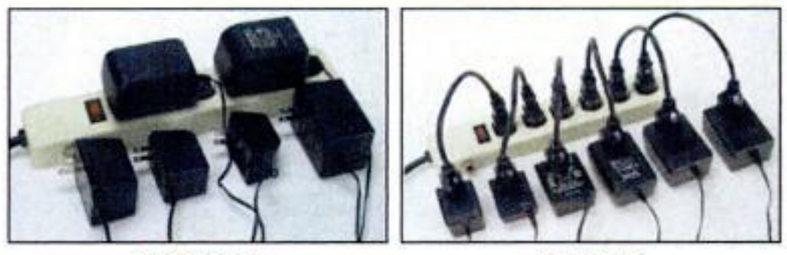
DVD-Rs are here! First came CD-Rs with capacities up to 700MB... now step up to DVD-Rs with a capacity of 4.7GB! These disks are compatible with burners that use DVD-R media for general purpose v.2.0. If you have lots of big files to archive and store, these are a great solution. Compatible with data files and some video applications.

To order call 800-892-1010 or online at www.cyberguys.com/mpc0303 154 0610 $1.29

Power Strip Liberator Classic



Power Strip Liberator allows you to use all of your outlets



BEFORE
Power Strip Liberator you could only use 2 outlets.

AFTER
Power Strip Liberator you can use all 6 of your outlets

A Cyberguys!® exclusive. Get full use of your power strips and UPS outlets with our high-quality adapter cable. Just plug those big bulky power adapters into our cables and plug the cables into those previously unusable outlets! Have a power cord that just won't reach? Buy a handy 1-foot extension and forget about those long, tangled extension cords.

To order call 800-892-1010 or online at www.cyberguys.com/mpc0303 121 2550 $1.79

PS/2 to USB Keyboard and Mouse Adapters

131 0840
Mouse Adapter

131 0845
Keyboard Adapter

Connect a USB keyboard or mouse to the PS/2 ports on your computer with these simple, compact adapters. Color-coded for easy installation.
Because of PS/2 limitations, these are not interchangeable.

To order call 800-892-1010 or online at www.cyberguys.com/mpc0303 $1.99 each

Groovy CD-Rs Look Just Like 45rpm Records

These CD-Rs combine a cool retro look with the rugged quality and high-performance of today's CD-R technology. Archive your cherished LP collection, burn a personal music mix or make a memorable business presentation. These CD-Rs are a blast from the past with a look toward the future!

State-of-the-art Azo Blue technology provides superior write performance and broad read compatibility. Dual-layer anti-scratch coating provides enhanced protection against sunlight, high temperature, humidity and handling.

To order call 800-892-1010 or online at www.cyberguys.com/mpc0303 154 0595 $8.29

USB 2.0 6-in-1 Flash Card Reader

Includes built-in cord, 3ft. USB 2.0 extension, drivers on CD and a leatherette pouch.

3 7/8"(W) x 2 1/2"(L) x 15/32"(H)

Read six different types of flash cards at blazing USB 2.0 speed! This tiny lightweight card reader comes with slots for the most popular flash memory cards all in one convenient unit.

To order call 800-892-1010 or online at www.cyberguys.com/mpc0303 204 0678 $52.95

Simple, Effective Computer Case Lock

- Replaces a standard case screw
- Includes one keylock and one key

To order call 800-892-1010 or online at www.cyberguys.com/mpc0303 132 0380 $1.99

CYBERGUYS!

Visit us online at:
www.cyberguys.com

We have 1000's of hard-to-find computer parts and accessories at low prices! Call 1-800-892-1010 or visit us online at www.cyberguys.com/mpc0303 to order your free catalog. Spend $100 and we'll throw in a cool Cyberguys t-shirt free. Use this free t-shirt code: 406-6501 when placing your order.

Copyrighted material

What
does your PC say about YOU?

EverQuest: Planes of Power
Starting with special chemical prints of EverQuest's incredible artwork, we meticulously airbrush the art to blend into our red/gold color-shifting paint. Then we submerge it under six layers of acrylic clearcoat. Finally we bake it to a tough, mirror-like finish. A $599.00 addition, just one of the infinite aesthetic possibilities of Falcon Northwest's custom PCs.

Falcon Northwest
Exotix
Express Yourself

www.falcon-nw.com (888) FALCON-1

SOE
SONY ONLINE ENTERTAINMENT
EverQuest is a registered trademark of Sony Computer Entertainment America Inc. SOE and the SOE logo are registered trademarks of Sony Online Entertainment in the U.S. and other countries. ©2003 Sony Computer Entertainment America Inc. Exotix and the Falcon Northwest logo are trademarks of Falcon Northwest Computer Systems, Inc. All rights reserved.

Copyrighted material

AM-COMPS.COM

Where Power, Performance & Quality Meet

FOR **BEST VALUE** AND **CONFIGURATION**
PLEASE VISIT OUR WEB SITE: **WWW.AM-COMPS.COM**
FREE SHIPPING ON ALL ITEMS!!!!!!!!!!!!!

starting at

$259

NEMESIS

- AMD ATHLON 1.3 GHZ
- 256MB PC133 SDRAM
- 15 GB ULTRA ATA HARD DRIVE
- 52X CD-ROM
- 56K MODEM
- 10/100 NETWORK ADAPTER

MEMORY CENTER

crucial 256ddr pc266	$79.48
kingston 512ddr pc266	$161.70
oem 256ddr pc333	$82.50

AMD PROCESSORS
Checkout our unbeatable prices on xp and mp processors. We have xp 2700+ in stock now.

ATI GRAPHICS
Is your current game not playing right on your computer? Upgrade your graphic card to an ATI Radeon card. we are now shipping radeon 9700 pro.

INTEL P4 PROCESSORS
Intel's most advanced and most powerful processors are now on sale here at am-comps. Available up to 3.06Ghz with 533Mhz FSB.

GAMING MONSTERS

Starting at $868.93

- SERIOUS POWER
- SERIOUS PERFORMANCE
- SERIOUS QUALITY
- AVAILABLE IN 8 COLORS
- FOR SERIOUS GAMERS ONLY

PROFESSIONAL SERIES

Starting at $713.87

- DUAL PROCESSORS
- PROFESSIONAL GRAPHICS
- DESIGNED FOR POWER
- BUILT ON STABILITY
- AVAILABLE IN SILVER, BLACK OR BEIGE

ENTRY LEVEL

Starting at $259.00

- HIGH PERFORMANCE
- LATEST TECHNOLOGY
- GREAT FOR HOME/OFFICE
- AVAILABLE IN BLACK OR BEIGE

888-905-9700

www.am-comps.com

am-comps.com 1 Abertson Ave, Albertson, NY 11507
PHONE: 516-626-7000 FAX: 516-626-7001
OUR OFFICE HOURS: 10:30 AM to 7:00 Eastern Standard Time

PRICE, SPECIFICATIONS, AND TERMS ARE SUBJECT TO CHANGE WITHOUT NOTICE. SYSTEMS CARRY ONE YEAR PARTS AND LABOR WARRANTY.

Copyrighted material

The Legend of TOP TECH. Cooling

TOP TECH.

T.O.P (Thermal Obviation Protection) represents MSI's cutting edge technology in designing the new copper-based cooler especially for Ti4200-8X and Ti4600-8X graphics cards. For general users, the cooling performance and the silence are two key requirements of a high-quality VGA cooler, also called Fan-sink. The cooling performance is directly related to the stability of the new-generation GPU (Graphics Processing Unit) and prevents from overheat when overclocking. On the other hand, as the GPU is becoming more complicated and powerful, the silence of a qualified VGA cooler is more important than ever because the total system cooling requirement and noise is getting higher.

The major benefits that TOP Tech. cooler can deliver are as follows:

1. Compared to NVIDIA's reference cooler, MSI's TOP Tech. cooler can control the thermal by 8.8 °C less at Ti4200-8X and 10.3125 °C less at Ti4600-8X.

Ti4200-8X	Ti4600-8X
NVIDIA Reference Cooler: 1.3° C/Watts	NVIDIA Reference Cooler: 1.3° C/Watts
MSI Cooler 0.75° C/Watts	MSI Cooler 0.75° C/Watts
Thermal Diff. (Under 16 Watts) -8.8°C	Thermal Diff. (Under 18.75 Watts) -10.3125°C

MSI Multimedia

2. Only generates 28db acoustics (The MOST silent cooler in the attached VGA roundup)

VGA Card	Voltage while running	Noise db / a	Fan
MSI Ti4200 / 4600-8X	11.7 V	28	
ASUS GeForce4 Ti4600	12 V	35.5	
Gainward GeForce4 PP! U 7580XP	8.6 V	35.8	
Leadtek WinFast A250 TD	2 X 11.8 V	40.5	
PNY GeForce4 Ti4600	11.9 V	30.5	
VisionTek GeForce4 Ti4400	12 V	35.3	

Source: MSI, Tom's Hardware

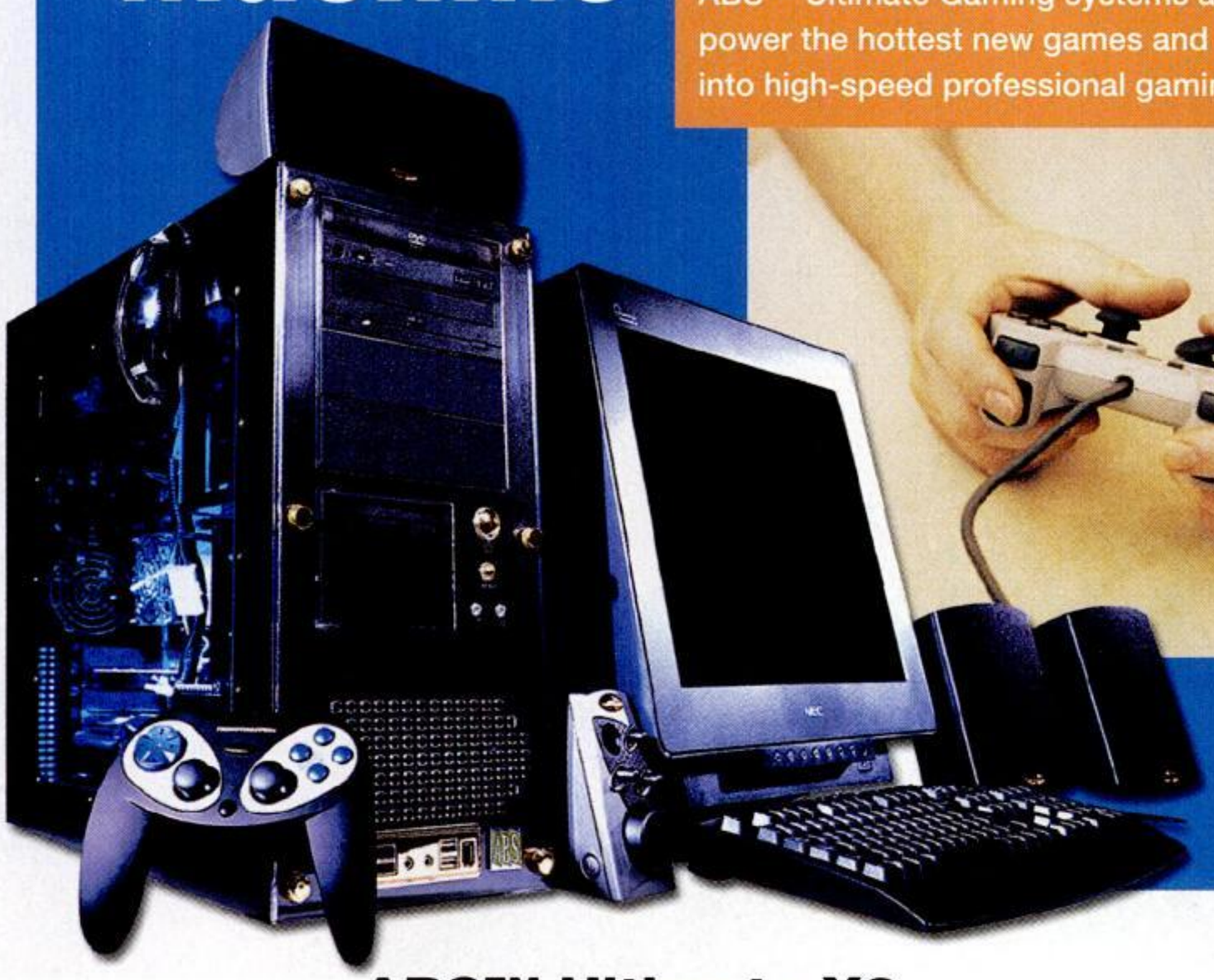
MSI
www.msicomputer.com
Tel: 626-913-0828
Fax: 626-913-0818

Copyrighted material

ABS™ Ultimate PCs with the
Intel® Pentium® Processor with Hyper-Threading Technology

Ultimate Gaming Machine

Supported by powerful Intel® Pentium® 4 processor, ABS™ Ultimate Gaming systems are the overwhelming choice to power the hottest new games and transform your personal PCs into high-speed professional gaming machines.



ABS™ PCs use genuine Microsoft® Windows®
www.microsoft.com/piracy/howtotell

ABS™ recommends Microsoft® Windows® XP

ABS™ Ultimate X3

Blue Kingwin Aluminum Case w/Acrylic Windows & Neon Light
Asus P4G8X Intel E7205 Chipset Motherboard w/533FSB & USB 2.0
Kingston 512MB 1066MHz RAMBUS Memory
120GB 7200RPM Ultra ATA100 Hard Drive w/8MB Cache
Pioneer 16X DVD Player & Mitsumi 1.44MB Floppy Drive
Lite-On 52X24X52 SMART-BURN® CD-ReWritable Drive
ATI Radeon 9700 Pro 128MB 8X AGP Video Card w/TV Out
Add SONY 19" .25mm 1024x768 Monitor @$319
Creative Labs SoundBlaster Audigy Sound Card w/IEEE 1394
3Com PCI 10/100 Network Card & USR V.90 PCI 56K Modem
Logitech Access Keyboard & Optical Mouse
Microsoft Windows® XP Home Edition
Free Games: Microsoft Age of Empires II and Dungeon Siege 1.0
Free 7/24 Tech Support and 1 Year Onsite Service

Intel® Pentium® 4 Processor with HT Technology at 3.06GHz w/533MHz FSB **$2199**

ABS™ Ultimate X7

Black Kingwin Aluminum Case w/Acrylic Windows & Neon Light
Asus P4G8X Intel E7205 Chipset Motherboard w/533FSB & USB 2.0
Kingston 512MB 1066MHz RAMBUS Memory
Two 80GB 7200RPM Ultra ATA 133 Hard Drives w/8MB Cache
Lite-On 16X DVD Player & Mitsumi 1.44MB Floppy Drive
Plextor 48X24X48 CD-ReWritable Drive
ATI Radeon 9700 Pro 128MB 8X AGP Video Card w/TV Out
ViewSonic 22" .25mm 1920x1440 Monitor
Creative Labs SoundBlaster Audigy XGamer Sound Card w/IEEE 1394
Klipsch ProMedia 5.1 THX 6-Pieces Speaker System
Logitech Cordless Freedom Optical Keyboard and Mouse
Microsoft Windows® XP Home Edition
Free Games: Microsoft Age of Empires II and Dungeon Siege 1.0
Free 7/24 Tech Support and 1 Year Onsite Service

Intel® Pentium® 4 Processor with HT Technology at 3.06GHz w/533MHz FSB **$3249**

ABS

800.639.1470 *Please use full URL to get latest prices and special promotions.* **www.abspc.com/mp03**

Sales Hours: Mon-Fri 8:30AM-5:30PM PST Technical Support: Mon-Fri 8:30AM-5:30PM PST
Technical Support: 800-685-3471 General Office: 562-695-8823 9997 East Rose Hills Road, Whittier, CA 90601

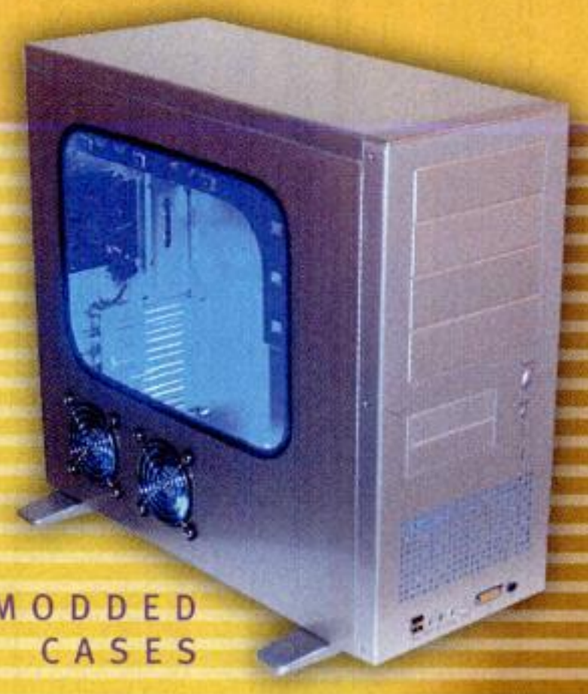
Price, specification, and terms are subject to change without notice. Picture shown with upgraded options. ABS™ is not responsible for errors in typography and/or photography. 30 days money back guarantee does not include opened software, parts, or special orders merchandise. Original shipping and handling fee along with return shipping charge are non-refundable. Products returned after 30 days or in a non-refundable condition are subject to a restocking fee. Intel, Intel Inside, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Copyrighted material

The nEXt generation of computer hardware has aRRived

ROUNDED CABLES

CASE LIGHTING



MODDED CASES

LED FANS

oxide.com

CLEAR CASES

WATER COOLING

HEAT SINKS

XOXIDE.COM

1.866.4.XOXIDE

Copyrighted material

HardDrive.com

Your GAMING Resource

We are the largest source for color components

We stock thousands of computer products

Aquarius II

Thermaltake
Aquarius II
COMPLETE
Liquid Cooling
System

$130

Maxtor 250GB

Maxtor 6Y250P0
ATA133 - 250GB
7200rpm
8MB Cache

$407

CRU Dataport II

Plastic Carrier
Plastic Frame
Supports 3.5" hard drives
IDE Ultra ATA-133
Key Lock ON/OFF security
Power/Drive Activity LEDs
One Year Warranty
Available in Black, Silver
Green, Yellow & Blue

$25

SALES LINE: 800-400-3499

Check Out These Puppies at HardDrive.com

THE PIT BULL

Intel® Pentium® 4 3.06 GHz with 533 FSB
Intel® E7205 Chipset with 533MHz FSB Motherboard
2 Seagate 120GB Serial ATA 150 Mbytes/sec, Raid 0
HardDrive.com KickAssGamingPC Modified Case

Antec True Blue 480 watt Power Supply
NVIDIA GeForce4 Ti4600 128MB 8x AGP
512MB PC-2100 DDR Memory
Windows XP Professional
FREE Lifetime Technical Support
10/100 Ethernet
Blue Sound Blaster Audigy 2 Platinum
Blue TDK 52x24x48 CDRW Drive
Blue Pioneer 16x40x DVD Rom Drive
Blue Rounded cables

Logitech Z680 Digital 5.1
Surround Sound System
Sold Seperatly - $288

$2,899

Check out more of Cameron @ harddrive.com/cameron

PREMIER PARTNER PROGRAM FOR STORAGE SOLUTIONS

intel premier PROVIDER 2003

Select Builder nVIDIA Program Member

Microsoft OEM System Builder

TESTED & GEEK APPROVED

BORED WITH BEIGE?

HardDrive.com is the largest source for color components, We stock thousands of color drives, keyboards & accessories! Plus OUR bezels are Maximum PC GEEK Tested & Approved.

SALES LINE: 800-400-3499

ThorTek Corp. 2800a West Main St League City ,Texas 77573 Lifetime FREE technical support.

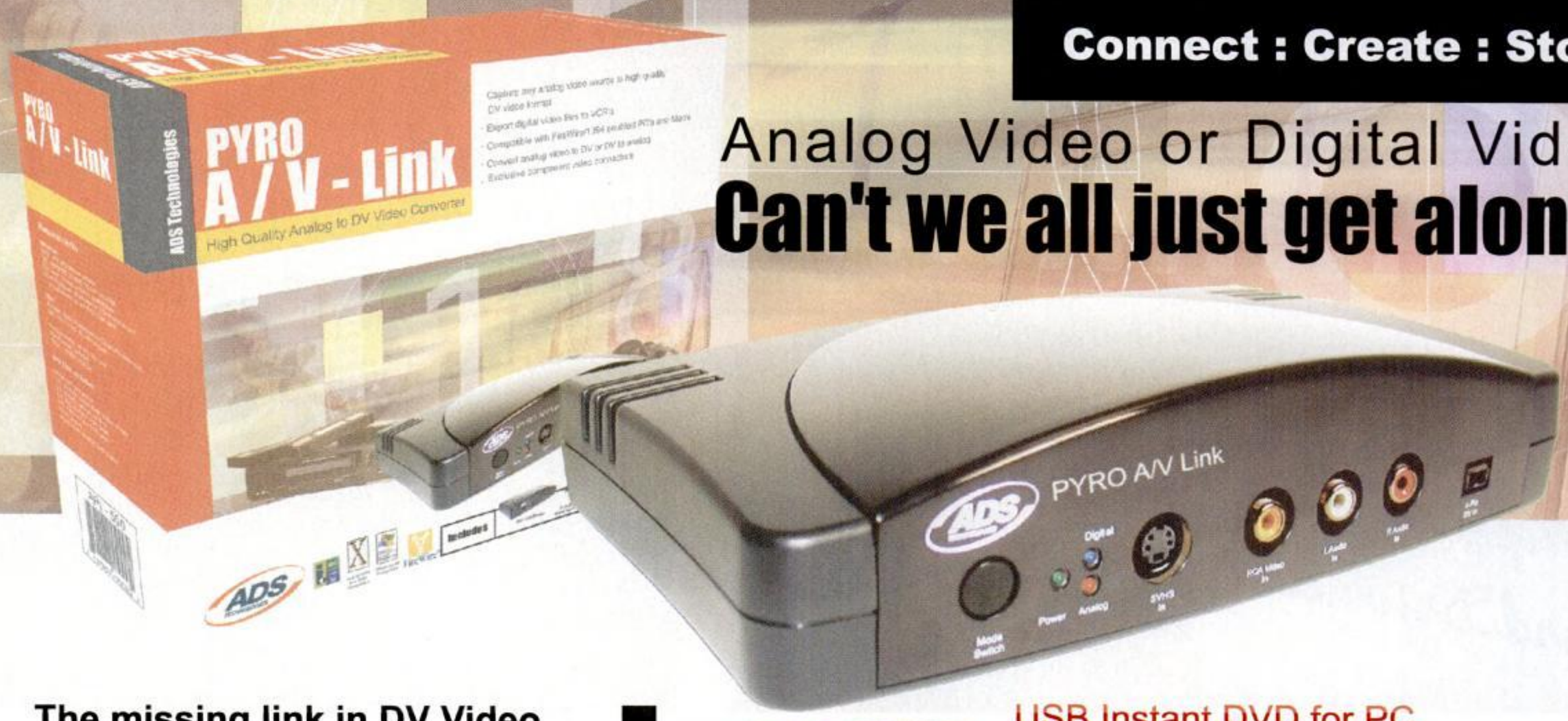
Prices & Specs subject to change without notice. Shipping charges are non refundable. Returns may be subject to restocking fee. Products are covered by manufacturers warranty only. We accept all Government PO's. Local calls 281.557.8336 Fax 281.557.1426

Photograph by Chris Freeman

Connect : Create : Store

Analog Video or Digital Video

Can't we all just get along?



The missing link in DV Video

The ultimate tool for capturing and converting video into professional quality DV format and just as valuable for exporting edited DV content to analog video tape recorders.

Capturing DV from a Digital camcorder is fantastic, but what about all of the video content you have in other formats (8mm, beta, VHS, DVD), how do you get that content into the DV format?
PYRO A/V link solves the problem by converting any analog video source into DV.

With exclusive Component Video Input!

PYRO A / V Link

Your Connection Between Digital and Analog Video

- Capture and convert any analog video source to High Quality DV video format
- Export DV to Tape - Send DV video files out through PYRO A / V Link to VCR's
- Convert video without a PC - convert analog to DV or DV to Analog between recorders
- High Quality Analog to DV Video Converter
- **COMPONENT VIDEO INPUT**

Includes:
- Ulead VideoStudio 6 SE DVD Edition

www.adstech.com

USB Instant DVD for PC

Convert Your Videos Into DVD Movies - on Your PC!

- USB Instant DVD gives you all the tools they need for capturing video in MPEG-2 format (DVD format) from ANY video source (Analog Camcorder, VCR, DVD Player, etc.)
- Capture Audio/Video in REAL TIME at full DVD 704 x 480 resolution

Includes:
- Ulead VideoStudio 6 DVD, MyDVD 3.5, Cyberlink Power DVD XP 4.0 Neptune MediaShare 3.0

USB Instant DVD for MAC

Convert Your Videos Into DVD Movies- ON YOUR MAC!

- USB Instant DVD for MAC gives you all the tools they need for capturing video in MPEG-2 format (DVD format) from ANY video source (Analog Camcorder, VCR, DVD Player, etc.) for the MAC
- Capture Audio/Video in REAL TIME at full DVD 720 x 480 resolution
- Edit videos and send back to VCR or burn to DVD

Includes:
- Pixela video Capturing, Captv DVD and DVD Authoring Software

PYRO 1394 DV

- Connect your DV camcorder to the world's best selling OHCI-compliant 1394/FireWire card
- Capture MPEG-2 in real time
- Record and preview in real-time
- Add titles, effects, voice-overs and music

Includes:
- Ulead VideoStudio 6 SE DVD, Ulead DVD MovieFactory, Ulead PictureShow, Neptune Media Sharing Trial

PYRO 1394 Webcam

- Offers the sharpest image quality on the Net
- 1394a and Camera specification 2.0 Compliant
- High-quality videoconferencing
- Clear, vivid pictures
- True Plug & Play performance

Includes:
- iSPQ Video Chat software, Yahoo Messenger, iVisit, Microsoft Netmeeting, Teveo Live Web Cam

USB Turbo 2.0 1394 Webcam

- USB 2.0 Connection for the Highest Quality Video
- 640 x 480 Resolution @ 30 frames per second
- High Quality Lens For Crystal Clear Video
- Clear, vivid pictures
- SnapShot Button for Still Image Capture

Includes:
- iSPQ Video Chat software, Yahoo Messenger, iVisit, Microsoft Netmeeting, Teveo Live Web Cam

Available everywhere including: Tiger Direct, Safe Harbor, Fry's, Comp USA,Circuit City, Bestbuy.com, FutureShop, Data Vision, JandR, Meritline.com, London Drugs, Microcenter, DVD-gear.com and more!

* CD-RW drive required to create CD-RW discs. DVD recordable drive required to create DVD discs.

* DON'T STEAL MOVIES. ADS Technologies respects the rights of copyrightowners an ask you to do the same.

ADS TECHNOLOGIES

www.adstech.com

Copyrighted material

XG6000-GAMER ULTRA SE

- NVIDIA nForce-2 Chipset 8X APG 333 FSB Motherboard
- Kingston 1024MB PC3200 400Mhz DDR Memory
- Western Digital 80GB 7200RPM 8MB Cache Special Edition
- ATI RADEON 9700 Pro 8X AGP 128MB DDR w/ TV out & DVI
- Sony 16X DVD-ROM & Sony 48X16X48 CD-RW Drive
- Creative Labs Sound Blaster Audigy X-Gamer 5.1 w/ 1394 IEEE
- Creative Cambridge SoundWorks Desk Top Theater 6.1 Insprie 6600 Sound System
- Creative Labs 56K V.92 Fax Modem w/ Voice
- 4 USB 2.0, 1 Firewire 1394 IEEE Port
- 1.44MB Floppy Drive & PS2 internet Keyboard
- Microsoft® USB Optical IntelliMouse
- Microsoft® Windows® XP Home Edition
- One Year On Site Service w/ 24/7 Techsupport
- **Aluminum TurboGamer SX635 Tower Case 420Watt**

AMD Athlon™ XP 2700+	$ 1559	XG3051
AMD Athlon™ XP 2600+	$ 1449	XG3052
AMD Athlon™ XP 2400+	$ 1415	XG3053
AMD Athlon™ XP 2200+	$ 1355	XG3054
AMD Athlon™ XP 2000+	$ 1339	XG3055
AMD Athlon™ XP 1800+	$ 1335	XG3056

XG4000-GAMER PLATINUM XP

- NVIDIA nForce-2 333Mhz FSB Motherboard
- Kingston 512MB PC3200 400Mhz DDR Memory
- Western Digital 80GB 7200RPM 8MB Cache Special Edition
- MSI NVIDIA Geforce-4 8x AGP TI4200 128MB DDR w/ TV Out & DVI
- Sony 16X DVD-ROM & Sony 48X16X48 CD-RW Drive
- Creative Lab Sound Blaster Live Audigy w/ FireWire 1394 IEEE Port
- Altec Lansing 251 5.1 PC Gaming Desktop Theater Speakers System
- 56K Modem, 1.44MB Floppy, Keyboard & Mouse
- Microsoft® Windows® XP Home Edition
- One Year On Site Service w/ 24/7 Techsupport
- **-AHANIX Platnium XP Case w/ Digital Thermometer & 420 Watt Power Supply**

AMD Athlon™ XP 2700+	$ 1209	XG3031
AMD Athlon™ XP 2600+	$ 1095	XG3032
AMD Athlon™ XP 2400+	$ 1065	XG3033
AMD Athlon™ XP 2200+	$ 999	XG3034
AMD Athlon™ XP 2000+	$ 982	XG3035
AMD Athlon™ XP 1800+	$ 972	XG3036

XG2000-ELITE

- MSI KT3 Ultra-2 VIA KT-333 w/ ATA 133 MB
- 512 MB PC2700 333Mhz DDR RAM Memory
- 60GB 7200RPM Ultra ATA100 Hard Drive
- NVIDIA Geforc-2 MX440 64MB AGP
- Sony 52X CD-ROM, 3D Wavetable Sound
- 480-Watt Subwoofer Speakers System
- 56K Modem, 1.44MB Floppy, Keyboard & Mouse
- Microsoft® Windows® XP Home Edition
- One Year On Site Service w/ 24/7 Techsupport
- **Black X-Gamer Medium Tower Case with See Through Window and Sound Activated Neon Light 350 Watt**

AMD Athlon™ XP 2600+	$ 719	XG3011
AMD Athlon™ XP 2400+	$ 685	XG3012
AMD Athlon™ XP 2200+	$ 625	XG3013
AMD Athlon™ XP 2000+	$ 605	XG3014
AMD Athlon™ XP 1800+	$ 575	XG3015

MONITOR UPGRADE

- AquaView 7GS.27 17" 1280x1024 (Black or White Color) ..... $ 129
- AquaView 9GX .25 19" 1600x1200 (Black or White Color) ..... $ 189
- Viewsonic E70F Perfect Flat .23H 17" 1280x1024 (Black or White Color) ..... $ 179
- Viewsonic E95 .22H 19" 1600x1200 (White) ..... $ 189
- Viewsonic E90F Perfect Flat .22H 19" 1600x1200 (Black or White Color) ..... $ 269

XG3000-WORKSTATION

- MSI 845PE-MAX Intel® I845PE Chipset 533Mhz FSB MB
- 512MB PC2700 266Mhz DDR Memory
- 60GB 7200RPM Ultra ATA100 Hard Drive
- MSI NVIDIA Geforce-4 MX440 64MB DDR w/ TV-Out
- 16X DVD-ROM & 40X12X48 CD-RW Drive
- MSI 6 Channels 5.1 Surround Sound Card
- 480-Watt Subwoofer Speakers System
- 56K Modem, 1.44MB Floppy, Keyboard & Mouse
- Microsoft® Windows® XP Home Edition
- One Year On Site Service w/ 24/7 Techsupport
- **Black X-Gamer Medium Tower Case with See Through Window and Sound Activated Neon Light 350 Watt**

Intel® Pentium® 4	3.06Ghz	$ 1215	XG3021
Intel® Pentium® 4	2.8Ghz	$ 985	XG3022
Intel® Pentium® 4	2.53Ghz	$ 789	XG3023
Intel® Pentium® 4	2.4Ghz	$ 759	XG3024
Intel® Pentium® 4	2.0Ghz	$ 745	XG3025
Intel® Pentium® 4	1.8Ghz	$ 719	XG3026

nVIDIA graphics

nVIDIA GeForce4 Ti

MSI

XTREME GEAR

VISA MasterCard DISCOVER

Price subject to change without notice. •

XG9000-GAMER DIGITAL PRO

- Intel® I850E Chipset Petitum® 4 533 FSB Motherboard
- Kingston 512MB PC1066 Rambus Memory
- Western Digital 80GB 7200RPM 8MB Cache Special Edition
- NVIDIA Geforce-4 TI4600 128MB DDR w/ TV Out
- Sony 16X DVD-ROM & Sony 48X16X48CD-RW Drive
- Creative Labs Sound Blaster Audigy X-Gamer 5.1 w/ 1394 IEEE
- Creative Cambridge SoundWorks Desk Top Theater 5.1 INSPIRE 5200 Sound System
- Creative Labs 56K V.92 Fax Modem w/ Voice
- 10/100 Network Interface Card
- 1.44 MB Floppy Drive & PS2 internet Keyboard
- Microsoft® USB Optical IntelliMouse
- Microsoft® Windows® XP Home Edition
- One Year On Site Service w/ 24/7 Techsupport
- **All Aluminum Kingwin KT436 Tower Case 420Watt w/ 3 See Through Windows & Sound Activated Neon Light**

Intel® Pentium® 4	3.06Ghz	533FSB	$ 1825	XG3041
Intel® Pentium® 4	2.8Ghz	533FSB	$ 1595	XG3042
Intel® Pentium® 4	2.53Ghz	533FSB	$ 1399	XG3043
Intel® Pentium® 4	2.4Ghz	533FSB	$ 1369	XG3044
Intel® Pentium® 4	2.0Ghz	512K	$ 1355	XG3045

TOLL FREE 1-888-937-5580

Copyrighted material

www.fica.com

FIC

Go power mad with the Chameleon

Ride This FIC Motherboard to Victory

Nothing stops you. You mow down armies, swamp navies, and blast air forces out of the sky. With the scorching speed of the nForce2 driving your motherboard, your performance bandwidth makes the other guys weep.

You've got the fastest, most stable, AMD-based PC environment known to gamers, with HyperTransport and a high-speed data bus. As a bonus, the Chameleon delivers stunning six-channel audio.

You want twice the raw system bandwidth of every other solution out there? Get the **RaptureWare AU11 Chameleon**. Then, let them call you power mad. They'll never stop you.

NVIDIA nForce 2

Fry's Electronics

Outpost.com

Visit Outpost.com or your nearest Fry's Electronics for more information.

CERTIFIED CMTL cmtlabs.com MEMORY

CERTIFIED CMTL cmtlabs.com MOTHERBOARD

©2002 First International Computer, Inc. All rights reserved. FIC and the FIC logo are trademarks of First International Computer, Inc. and NVIDIA and nFORCE are trademarks and/or registered trademarks of NVIDIA Corporation. All other company and/or product names are trademarks and/or registered trademarks of their respective owners.

newegg.com

Best Value, Always!

No Rebate Hassle!

Internet Mouse
600DPI, Internet Easy+
2 Buttons + Scroll Wheel, PS2 connection. OEM
Limit ONE per Customer!
While Supplies Last

$0 Shipped for $6
N82E16826129001

AMD Athlon
2100+/XP (1.736GHz) 266MHz FSB CPU 256K L2 Cache Retail Version (with heatsink and fan)

$95 Shipped for Free
N82E16819103329

Intel Pentium 4
2.4GHz 533MHz FSB CPU 512K L2 Cache Northwood Socket 478 Retail Version (with heatsink and fan)

$159 Shipped for Free
N82E16819116139

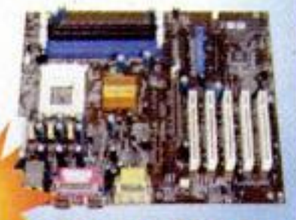
Samsung
64MB SmartMedia Card
3.3Volt, OEM

$19 Shipped for $5
N82E16820167107

Crucial/Micron
256MB PC2100 DDR RAM
6 layer unbuffered 2.5V 184 pins CL=2.5 OEM Version

$56 Shipped for Free
N82E16820145001

ECS
K7S5A SiS735 Motherboard
Supports both DDR and SDRAM, ATA100, AC97 Sound, 10/100 LAN Port Retail Version

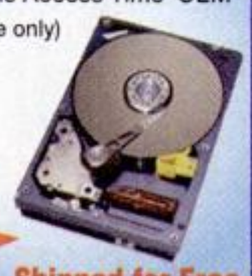


$54 Shipped for Free
N82E16813135102

IBM
40GB 7200RPM HD
2MB Cache 7200RPM EIDE ATA100 8.8ms Access Time OEM Version (Drive only)

$82 Shipped for Free
N82E16822145018

Western Digital
80GB "Special Edition" HD
8MB Cache 7200RPM EIDE ATA100 8.9ms Access Time OEM Version (Drive only)

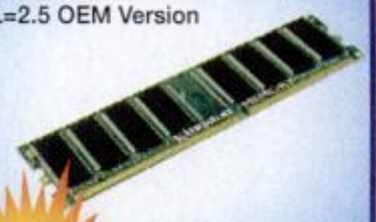


$109 Shipped for Free
N82E16822144122

Samsung
64MB Compact Flash Card
1.2MB/s Write Speed, OEM Version

$23.5 Shipped for $6
N82E16820167902

Kingston
512MB PC2700 DDR RAM
6 layer unbuffered 2.5V 184 pins CL=2.5 OEM Version



$125 Shipped for Free
N82E16820144201

Olympus
C-4000 4M Pixel Camera
3X optical Zoom, 3.3X digital Zoom Retail

$399 Shipped for Free
N82E16830111105

Shuttle
SB51G Barebone PC
Support P4/Celeron 400/533FSB 478 Socket, Onboard LAN, Sound, VGA, Retail

$342 Shipped for Free
N82E16856101215

Asus
A7N266-VM AA Motherboard
nForce 220 Chipset 2 DIMM Socket, ATA133, Onboard 10/100 LAN and AC97 Sound Retail Version

$72 Shipped for Free
N82E16813131433

Corsair
256MB XMS PC3200 DDR RAM
Extreme Memory Speed Series, 400MHz Bus Speed. 2-3-3-6-T1 CAS Latency, OEM

$103 Shipped for Free
N82E16820145415

Viewsonic
19" P95F+B CRT Monitor
Perfect Flat 18" Viewable .25mm DP, Max 2048x1536 Resolution, Retail,
Color: Black

$259 Shipped for Free
N82E16824116232

LeadTek
TV2000XP TV/FM Card
Features Video/Audio on Demand and Pre-Scheduled digital recordings of TV/FM programs. Retail Version

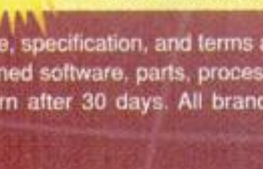
$57 Shipped for Free
N82E16814122132

Gainward
Geforce3 TI200 128MB
Power Pak Golden Sample, 4ns RAM, 2X/4X AGP Support. Retail Version

$105 Shipped for Free
N82E16814128116

ONLINE ORDERS ONLY @ NEWEGG.COM/MAX

Creative Labs
Modem Blaster 56K Modem
V.92 PCI version with V.44 Compression. Data and Fax mode, OEM Version (includes cable and driver)

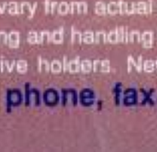


$19 Shipped for $5
N82E16825117102

Liteon
16X DVD ROM Drive
48X Max CD-ROM Read, OEM Version (includes Power DVD Software, Audio Cable).
Color: BLACK

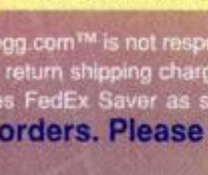
$46 Shipped for Free
N82E16827131109

HP
C6578DN Ink Cartridge Color
Works with: 930 932 935 940 950 952 955 960 970 990C 995 1200 3820 6122 6127 P1000, P1100 P1115 P1215 P1218 P1315...



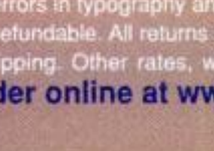
$31 Shipped for Free
N82E168217102107

Apple
Mac OS X V10.2 Jaguar
Retail



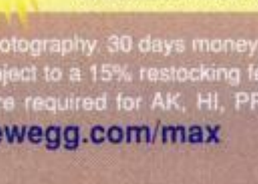
$119 Shipped for $5
N82E16832110101

Symantec
Norton SystemWorks 2003
OEM Version includes:
Norton Utilities
Norton CleanSweep
GoBack 3 Personal Edition
Web Tools
Norton Antivirus



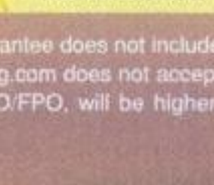
$19 Shipped for $5
N82E16832108117

Warcraft III:
Reign of Chaos
BY BLIZZARD
Retail
For PC-CD-ROM and MAC



$28 Shipped for Free
N82E16832127103

NeverWinter Nights
By Infogrames
Retail
For PC-CD-ROM



$29 Shipped for $5
N82E16832129101

Chieftec
Silver Server Tower Case
Dragon Series Entry Level Server with Acrylic Window. 450 Watts AMD/P4 Power Supply
Aluminum with Plastic Front

$105 Shipped for Free
N82E16811125202

Antec
Mini Tower Case
Solution Series SLK2600AMB 8 Bays, Antec Smart Power 300 Watts AMD/P4 Power Supply

$56 Shipped for $15
N82E16811129117

Round Cable
18 Inch ATA 133 IDE Cable
True ATA 133/100/66/33 (Silver/Clear) IDE Cable, 3 Heads, with Pull Tab

$7.5 Shipped for $6
N82E16812104504

APC
PRO 420 PNP UPS
User Renewable UPS System
Retail

$178 Shipped for $12
N82E16842101112

Linksys
BEFW11S4 Wireless Router
AP+Cable/DSL with 4 Port Switch, 10/100 Support
Retail

$105 Shipped for $8
N82E16833124002

50' Cat5 Cable
350MHz, Blue Color
With Snag-Free Caps
OEM

$7 Shipped for $6
N82E16812117604

Optodisc
4.7GB DVD-R Disk
Write Once Blank Media
Includes Case
Priced in Box of 30.

$1.7 ea Shipped for Free
N82E16817131706

Price, specification, and terms are subject to change without notice. Picture may vary from actual product. Newegg.com™ is not responsible for errors in typography and/or photography. 30 days money back guarantee does not include opened software, parts, processor, or special order merchandise. Original shipping and handling fee along with return shipping charge are non-refundable. All returns are subject to a 15% restocking fee. Newegg.com does not accept return after 30 days. All brands and products are trademarks of their respective holders. Newegg.com uses FedEx Saver as standard shipping. Other rates, which are required for AK, HI, PR, and APO/FPO, will be higher.

Newegg.com does not accept phone, fax, or email orders. Please only order online at www.newegg.com/max

XP-SPECIAL

$ 965

- NVIDIA® nForce™2 Motherboard w/ 8X AGP
- 512MB PC3200 400Mhz DDR Memory
- 80GB 7200RPM Ultra ATA100 Hard Drive
- NVIDIA® Geforce™4 8X AGP MX440 64MB w/ TV Out
- 16X DVD-ROM
- 48X16X48 CD-RW Drive
- 3D Wave Sound & 450Watt Subwoofer System
- **Viewsonic® 19" E95 .22MM SVGA Monitor**
- 56K Modem & Floppy Drive
- Internet Keyboard & Mouse
- **Aluminum** SX1030 SOHO Server Tower Case 425Watt w/ MOD "See Through Windows" & Neon Light
- 6 Cool Custom Colors to Choose From
- Microsoft® Windows® XP Home Edition
- Free First Year On Site Service plus 24/7 Tech Support

AMD Athlon™ XP Processor 2600+[2]	$ 1109	CXA301
AMD Athlon™ XP Processor 2400+[3]	$ 1075	CXA302
AMD Athlon™ XP Processor 2200+[4]	$ 1015	CXA303
AMD Athlon™ XP Processor 2100+[5]	$ 995	CXA304
AMD Athlon™ XP Processor 2000+[6]	$ 989	CXA305
AMD Athlon™ XP Processor 1800+[7]	$ 965	CXA306

"CYBERPOWER RECOMMENDS MICROSOFT® WINDOWS® XP"

AMD Athlon™ PROCESSOR XP

WWW.CYBERPOWERINC.COM

CyberPower PCs use genuine Microsoft® Windows®
www.microsoft.com/piracy/howtotell

XP-R/V MEDIA PRO

$ 1079

- NVIDIA® nForce™2 Motherboard w/ 8X AGP
- 512MB PC3200 DDR 400Mhz Memory
- 80GB 7200RPM ATA133 Hard Drive
- NVIDIA® Geforce™4 MX440 8X AGP Version 68MB DDR w/ TV Out
- 16X DVD-ROM & 48X16X48 CD-RW Drive
- Creative Lab Sound Blaster Live 5.1 Sound Card
- Creative Lab Inspire 4400 4.1 Subwoofer System
- **Viewsonic® 19" E95 .22MM SVGA Monitor**
- 56K Modem & Floppy Drive
- Internet Keyboard & Mouse
- **Aluminum** SX1030 SOHO Server Tower Case 425Watt w/ MOD "See Through Windows" & Neon Light
- 6 Cool Custom Colors to Choose From
- Free First Year On Site Service plus 24/7 Tech Support
- Upgrade to Viewsonic Office Keyboard and Optical Mouse +$49

AMD Athlon™ XP Processor 2800+	$ 1385	CXB301
AMD Athlon™ XP Processor 2700+	$ 1309	CXB302
AMD Athlon™ XP Processor 2600+	$ 1195	CXB303
AMD Athlon™ XP Processor 2400+	$ 1165	CXB304
AMD Athlon™ XP Processor 2200+	$ 1099	CXB305
AMD Athlon™ XP Processor 2000+	$ 1085	CXB306
AMD Athlon™ XP Processor 1800+	$ 1079	CXB307

TITANIUM GAMER FORCE PRO

$ 1249

- NVIDIA® nForce™2 Motherboard w/ 8X AGP
- 512MB PC400 PC3200 DDR Memory
- 80GB 7200RPM Ultra ATA133 Hard Drive
- NVIDIA® Geforce™4 TI4600 8X AGP 128MB w/ TV Out & DVI
- 16X DVD-ROM & 48X16X48 CD-RW Drive
- Creative Lab Sound Blaster Live 5.1 w/ 1394 IEEE
- Creative Cambridge Desk Top Theater 5.1 Inspire 5200 5.1 Surround Sound System
- **Viewsonic® 19" E95 .22MM SVGA Monitor**
- 56K Modem & 1.44MB Floppy Drive
- PS2 internet Keyboard
- Microsoft® Optical IntelliMouse
- **Aluminum** SX1030 SOHO Server Tower Case 425Watt w/ MOD "See Through Windows" & Neon Light
- 6 Cool Custom Colors to Choose From
- Microsoft® Windows® XP Home Edition
- Corel Wordperfect Office 2002
- Free First Year On Site Service plus 24/7 Tech Support

AMD Athlon™ XP Processor 2800+	$ 1585	CXC301
AMD Athlon™ XP Processor 2700+	$ 1506	CXC302
AMD Athlon™ XP Processor 2600+	$ 1395	CXC303
AMD Athlon™ XP Processor 2400+	$ 1365	CXC304
AMD Athlon™ XP Processor 2200+	$ 1299	CXC305
AMD Athlon™ XP Processor 2000+	$ 1279	CXC306
AMD Athlon™ XP Processor 1800+	$ 1249	CXC307

XTREME GAMER PLATINUM PRO

$ 1485

- NVIDIA® nForce™2 Motherboard with 8X AGP
- 1GB PC400 PC2700 DDR Memory
- 80GB 7200RPM Ultra ATA133 Hard Drive
- ATI® Radeon™ 9700 PRO 8X AGP w/ 128MB DDR RAM
- 16X DVD-ROM & 48X16X48 CD-RW Drive
- Creative Laib Sound Blaster Audigy X-Gamer 5.1 w/ IEEE
- Creative Cambridge SoundWorks Desk Top Theater 5.1 Inspire 5200 5.1 Surround Sound System
- **Viewsonic® 19" E90FB .22MM SVGA Monitor**
- 56K Modem & 1.44MB Floppy
- Silver PS2 Internet Keyboard
- Microsoft® Optical intelli Explorer Mouse
- **Aluminum** SX1030 SOHO Server Tower Case 425Watt w/ MOD "See Through Windows" & Neon Light
- 6 Cool Custom Colors to Choose From
- Microsoft® Windows® XP Home Edition
- Free First Year On Site Service plus 24/7 Tech Support

AMD Athlon™ XP Processor 2800+	$ 1819	CD301
AMD Athlon™ XP Processor 2700+	$ 1739	CD302
AMD Athlon™ XP Processor 2600+	$ 1629	CD303
AMD Athlon™ XP Processor 2400+	$ 1595	CD304
AMD Athlon™ XP Processor 2200+	$ 1535	CD305
AMD Athlon™ XP Processor 2000+	$ 1519	CD306
AMD Athlon™ XP Processor 1800+	$ 1485	CD307

CyberPower Inc.

Price subject to change without notice. •
4802 Little John St. Baldwin Park, CA 91706
Tel: (626)813-7730 • Fax: (626)813-3810
Technical Support (877)876-4965
Hour:Mon-Fri 8:30A.M. ~ 6:00P.M.
Sat 9:30A.M. ~ 3:00P.M.

1 QuantiSpeed™ architecture outperforms competive 2.70GHz processors, QuantiSpeed™ architecture operates at 2.33GHz.
1 QuantiSpeed™ architecture outperforms competive 2.60GHz processors, QuantiSpeed™ architecture operates at 2.13GHz.
2 QuantiSpeed™ architecture outperforms competive 2.40GHz processors, QuantiSpeed™ architecture operates at 2.00GHz.
3 QuantiSpeed™ architecture outperforms competive 2.20GHz processors, QuantiSpeed™ architecture operates at 1.80GHz.
4 QuantiSpeed™ architecture outperforms competive 2.10GHz processors, QuantiSpeed™ architecture operates at 1.73GHz.
5 QuantiSpeed™ architecture outperforms competive 2.00GHz processors, QuantiSpeed™ architecture operates at 1.67GHz.
6 QuantiSpeed™ architecture outperforms competive 1.80GHz processors, QuantiSpeed™ architecture operates at 1.533GHz.

ORDER TOLL FREE (800)707-0393

Copyrighted material

VELOCITY micro

"...care and craftmanship that the behemoth manufactures can't offer." - *MaximumPC*

MAXIMUM PC KICK ASS PRODUCT — July '02

PC GAMER EDITORS' CHOICE — August '02

Don't Alienate yourself. You have a better option.

Velocity Micro hand-builds custom computer systems that are nearly as gorgeous as they are powerful. Individually tuned and tweaked for maximum performance, we prove that a computer is far more than the sum of it's parts. Priced for any budget, we cover the range from dedicated gaming rigs and A/V systems, to CAD workstations, supremely powerful notebooks, and even corporate computers. Try our online system wizard today to custom configure your perfect system, and Pump-Up your experience to the next level.

PUMP it UP!

1-800-303-7866

www.velocitymicro.com

© 2002 by Velocity Micro, Richmond, VA .

#1 Koolance Volume Reseller

KOOLANCE INC.

LIQUID COOLING SYSTEMS

PC2-C PC2-601W PC2-901W

Big Event

Koolance PC2-C, PC-601W, PC-901W White Server Cases with Liquid Cooling System + ***Free*** CPU Cooler (CPU-200G) and Full Manufacturer Warranty.
(Case + Cooler)

- ***PC2-C** $169.90
- ***PC-601W** $199.90
- ***PC-901W** $264.90

PC2-601BLW PC2-601BW

*Blue and Black models are also available at higher prices. Availability is limited to quantity in stock.

You imagine, We deliver.

Toll Free 1-877-51-ORDER(67337)

iNFOTECHNOW.com

Premium PC
Obsessed with power

DARE TO COMPARE!

Intel P4 2.53 GHz with 512K, 533FSB
PC-2100 512**GB DDR** Memory
Asus P4S-533 DDR 333 Motherboard
Asus 9280 GF4 Ti 4200 128MB Video
Creative SB Audigy Sound card
16X DVD IDE (Black)
CDRW 40X12X48 IDE (Black)
IBM **120GB IDE 7200 ATA**
Intel 10/100 fast ethernet
Microsoft Windows Home
Microsoft Natural PS2 Keyboard
Microsoft Explorer Optical USB Mouse
LIAN-LI PC-65 Black Case
Fortron ATX 350W P-4 Power Supply
ALTEC LANSING 5100 Speaker
*3-yr Labor and 1-yr Parts Warranty

Best Performance at the Best Price!!

$1599.90

"The Exos was the best-performing water-cooling system we've ever tested." - Maximum PC

$209.90

EXOS

External Cooling System

***Free Koolance T-Shirt** with online purchase over $100.00 during the month of MAR, 2003*

*Price and availability is subject to change without notice

© Copyrighted material

Look for pcToys products at...

COMPUSA TigerDirect.com MICRO CENTER online CoolerGuys.com

BIG TIME COOL

From cold cathode light kits to bright colored rounded cables, LED lighted fans to multifunction system panels, *pcToys* is your one source for custom components and accessories that will turn your boring PC into one of the highest performing, coolest looking systems on the planet.

pcToys®

www.pcToys.com

Play Hard™

Eliminate the Guesswork.

Games Freezing?
Random Lockups?
Mystery BSoDs?
Fatal Exception Errors?
Parity Errors?

WARNING
A fatal exception has occurred at 0088:55bb8 in VMN.Tme current application will be terminated.
* Press any key to terminate.
* Press CTRL+ALT+DEL to restart.
Press any key to continue.

QuickTech Professional gives you unmatched troubleshooting capabilities. QTP will put your system through the most vigorous diagnostics available; over 300 tests to pinpoint the most evasive system errors. It also captures detailed system information, capable of displaying up to 65 pages that can be viewed on screen, saved to file, or sent to a printer. QuickTech Pro supports PC 486 through Intel Pentium 4, AMD, and Cyrix compatible processors.

Quick. Simple. Accurate.

Features:

O/S Independent Self Boot
Customizable Burn-In
System Board Testing & Analysis
Critical RAM Testing
IDE/ATAPI Testing
LPT, COM, & USB Port Testing
Video, Modem, & Sound Card Testing
& Much More!

Examines ALL Types of Memory

EDO DRAM
SDRAM PC-66-133-150
ECC & Parity
DDR PC1600/2100/2700 [New]
RDRAM(RAMBus)-PC600/800/1200 [New]

Kit Includes:

QuickTech Professional
QuickTech Personal
LPT & COM Port Loopbacks
Blue Professional Carrying Case

GSA Contract Number GS-35F-0260L

ULTRA-X, INC.
www.uxd.com

For more information:
1-888-722-3734
Tel: 1-909-946-8321 Fax: 1-909-946-7639 Email: sales@uxd.net

DMS DATA MEMORY SYSTEMS **Memory Upgrades**
Memory is our middle name

Best Quality,Service and Price since 1987

TOLL FREE 800.662.7466
www.datamem.com

DMS Certified Memory*

PC133 SDRAM DIMMs
- 128MB - $21.00
- 256MB - $36.00
- 512MB - $69.00

PC2100 (PC266) DDR DIMMs
- 128MB - $43.00
- 256MB - $58.00
- 512MB - $107.00

PC2100 (PC266) DDR 200-pin SODIMM
- 128MB - $45.00
- 256MB - $65.00
- 512MB - $124.00

* DMS Certified: All memory is DMS tested and guaranteed for life.

Compact Flash
- 64MB - $30.00
- 128MB - $49.00
- 256MB - $94.00
- 512MB - $195.00

Transcend 25X

SmartMedia
- 32MB - $17.00
- 64MB - $27.00
- 128MB - $54.00

Sony Memory Sticks
- 64MB - $39.00
- 128MB - $69.00

Secure Digital
- 64MB - $46.00
- 128MB - $79.00
- 256MB - $165.00

MultiMedia Card
- 64MB - $49.00
- 128MB - $85.00

Hard Drives

3.5" Internal ATA / IDE
- 60GB IBM DeskStar 120GXP ATA/100 7200rpm - $102.
- 120GB Maxtor DiamondMax D540X ATA/133 5400rpm $153.
- 180GB WD Caviar WD1800JB ATA/100 7200rpm/8MB Buff.- $330.

2.5" Notebook Hard Drives
- 20GB IBM Travelstar 40GN ATA-5 4200rpm - $93.
- 40GB Toshiba Super Slimline ATA-5 5400RPM - $133.
- 60GB IBM Travelstar 60GH ATA-5 5400rpm - $294.

All ATA / IDE 2.5" & 3.5" Hard Drives carry a 3 Yr. Warranty.

LACIE made for ideas® — Firewire & USB CD-RW Drives
- CD-RW Firewire External 52X24X52 - $196.00
- CD-RW Firewire External 48X12X48 - $177.00
- CD-RW USB 2.0 External 48X12X48 - $177.00

LACIE made for ideas® — Firewire & USB External Hard Drives
- 80GB Firewire 7200rpm External Hard Drive - $219.00
- 120GB Firewire 7200rpm External Hard Drive - $265.00
- 80GB USB 2.0 5400rpm External Hard Drive - $206.00
- 120GB USB 2.0 5400rpm External Hard Drive - $255.00

Transcend

Jet Flash USB Flash Drive
- 64MB - $38.00
- 128MB - $77.00
- 256MB - $137.00
- 512MB - $280.00
- 1GB - $689.00

DMS offers memory upgrades for: Desktops • Notebooks • Servers • Routers • Cameras • Printers • Samplers. Notebook batteries & AC adapters • Networking products • Cables • USB/Firewire accessories

PRICES POSTED ARE CURRENT AS OF 12/13/02 AND ARE SUBJECT TO CHANGE.

DMS DATA MEMORY SYSTEMS 24 Keewaydin Dr. Salem,NH 03079
Tel. 603-898.7750 | Fax: 603.898.6585

Copyrighted material

System Special

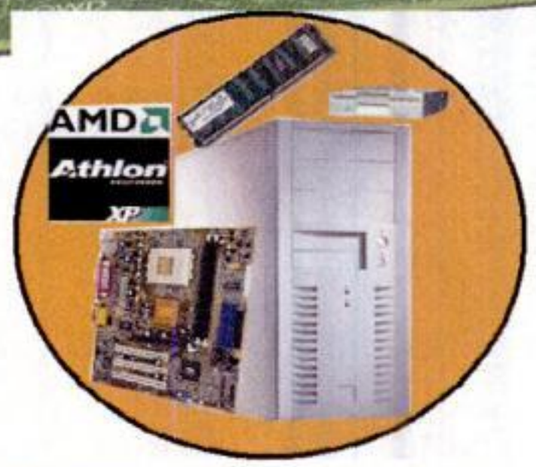
AMD Athlon XP 1800+ System #3

AMD Athlon XP1800+
Asus A7N266-VM Motherboard
128 megs DDR memory
20 gig Maxtor Hard Drive ata133-7200rpm
Teac Floppy Drive
Sony 52x CD-Rom
Sound Card
10/100 Lan Card
32 meg Video Card
Mid Tower Case with 300 watt power supply
$394.00 - See details on web

EZ-Upgrade - Intel Bare Bones System
Intel Pentium 4 Processor
Intel 3 year warranty and heatsink & fan unit
Intel D845 GERG2LR motherboard, DDR333 support, built on Video, built on Lan 10/100, built on Audio, USB 2.0
128 megs of DDR PC-2700 memory
Teac 1.44 Floppy Drive
Mid Tower Case #68U2 w/300 watt power supply

System is assembled and burned in for 48 hours
Intel P4 1.8 GHz. $397
Intel P4 2.0 GHz. $422
Intel P4 2.4 GHz. $456
Customize this on our website to meet your needs

**Check web for current price



EZ-Upgrade - AMD Bare Bones System
AMD Athlon XP Processor Retail box version with AMD 3 year warranty and Heatsink / Fan
DFI AZ30-EL Motherboard, Socket A
Built on video card,
Built on 10/100 Lan card
Built on Sound card, USB 2.0
256 meg of DDR SDram memory PC-2100
Teac Floppy Drive, 1.44 meg, 3.5 inch
Mid Tower ATX Case #68U2 w/ 300 watt power supply
System is assembled and burned in for 48 hour
XP 1800+ $286 XP 2000+ $299
XP 2200+ $389 XP 2400+ $427

***Check website for current prices

Now is the time to upgrade your old PC with our Bare Bones Systems, they're a great solution because of the low cost and they add the necessary performance you've been wanting.

Processors

Super low prices on All AMD & Intel Processors

See More on the website!
Intel P4 - Socket 478
All Retail Box Version
P4 3.06 GHz. 512k 533 MHz bus
$641
P4 2.8 GHz 512k 533 MHz bus
$409
P4 2.66 GHz 512k 533 MHz bus
$309
Retail Box means it comes with the Heatsink & Fan and the Intel 3 year warranty
AMD Athlon XP
XP 2700+ Retail Box $299
XP 2400+ Retail Box $206
XP 2200+ Retail Box $174
AMD Duron
1.3 GHz. 200 FSB Retail Box $52
1.2 GHz. 200 FSB Retail Box $49
OEM means cpu only, 90 day warranty
Retail Box means it comes with Heatsink & Fan and AMD 3 year warranty
All CPU Prices change daily, best to check website for current price

Memory

DDR 256 meg PC-2700 $59

RDram 256 megs PC800 $89

Goto our website to see all the memory we offer

VeriSign™ BBB Member BBB Online VeriSign Secure Site

We sell it all!, Check out our website. Motherboards, Memory, Processors, Hard Drives, Video Cards, CD-Burners, LCD Monitors, Cases, Power supplies, CPU Fans, Keyboards, Mice, Windows Software. It's all on our website and we always have the lowest prices.
Don't know how to build a PC? we'll show you how on our website, it's Free!

Computer Services Group - www.csg2000.com
1-800-798-1880 Fax 949-646-7029
Shippng/Mailing address: 1927 Harbor Blvd. #395, Costa Mesa, CA 92627
30 day return period for refunds from purchase date, after 30 days only warranty exchange, no returns on software. All returns require an RMA # please email or go to our website to get an RMA #, shipping is non refundable, complete return policy can be found on our website.

AD INDEX

For more information on MAXIMUM PC advertisers' products and services, please contact the companies below:

COMPANY	CONTACT	PAGE
ABS Computers	www.buyabs.com	83
ADS Technology	www.adstech.com	86
Alienware	www.alienware.com	C3.C6
Am-comps.com	www.am-comps.com	81
Antec	www.antec.com	31
ATI Technologies	www.atitech.ca	7
Brother International Corp	www.brother.com	41
Coast to Coast Memory	www.18004memory.com	95
Computer Services Group	www.csg2000.com	94
Computer Wizards	www.the-wizards.com	95
Crazy PC	www.crazypc.com	95
Crucial Technology	www.crucial.com	21
Cyberguys	www.cyberguys.com	79
Cyberpower	www.cyberpowerpc.com	91
Data Memory Systems	www.datamem.com	93
Dell Computer Corporation	www.dell.com	C2.1
Falcon Northwest	www.falcon-nw.com	80
First International Computer of America	www.fica.com	89
Full Sail Real World Education	www.fullsail.com	95
Gateway	www.gateway.com	67
Hitachi	www.hitachi.com	19
ibuypower.com	www.ibuypower.com	87
Koolance	www.koolance.com	92
M -Audio	www.m-audio.com	29
Microsoft	www.microsoft.com	34.35
MSI Computers	www.msicomputer.com	82
NewEgg.com	www.newegg.com	90
OC System	www.ocsystem.us	78
PC Power & Cooling Inc.	www.pcpowercooling.com	46
PC Toys	www.pctoys.com	93
Pioneer Electronics	www.pioneerelectronics.com	4
Roxio	www.roxio.com	2
Silicon Valley Compucycle	www.svc.com	55
Sony Electronics	www.sony.com/di	14.15
TDK Electronics Corp.	www.tdk.com	51
The Voodoo Computer Studio	www.voodoo.com	20
Thompson's Computer Warehouse	www.tcwo.com	75
Thomson Education Direct	www.EduDirect-usa.com	73
ThorTek Corp. (HardDrive.com)	www.harddrive.com	76.77, 85
Ultra-X, Inc.	www.uxd.com	93
Velocity Micro	www.velocitymicro.com	92
Xoxide	www.xoxide.com	84
Xtreme Gear	www.buyxtremegear.com	88

MAXIMUM PC (ISSN 1522-4279) is published monthly by Future Network USA, 150 North Hill Drive, Suite 40, Brisbane, CA 94005, USA. Periodical class postage paid in Brisbane, CA, and at additional mailing offices. Newsstand distribution is handled by Curtis Circulation Company. Basic subscription rates: one year (12 issues) US: $20; Canada: $26; Foreign: $42. Basic subscription rates "Deluxe" version (w/CD): one year (12 issues/12 CD-ROMs) U.S.: $30; Canada: $40; Foreign $56. US funds only. Canadian price includes postage and GST (GST#R128220688). Postmaster: Send changes of address to Maximum PC, P.O.Box 5159, Harlan, IA 51593-0659. Standard Mail enclosed in the following edition: None. Ride-Along enclosed in the following editions: B, C, C1, C2, C3, C4, C5 Int'l Pub Mail# 0781029. For customer service, write Maximum PC, P.O. Box 51479, Boulder, CO 80328-1479; Maximum PC, 150 North Hill Drive, Brisbane, CA 94005. Future Network USA also publishes PC Gamer, PSM, MacAddict, and Official Xbox.

Entire contents copyright 2003, Future Network USA. All rights reserved. Reproduction in whole or in part is prohibited. Imagine Media Inc. is not affiliated with the companies or products covered in Maximum PC. PRODUCED AND PRINTED IN THE UNITED STATES OF AMERICA.

Copyrighted material

Online Shopping | Online Forums | Online Tracking
Real Technical Support by Real Technicians

Computer Wizards

Your Complete PC Resource

Shop Online or Call 1-(800)-431-3153

www.the-wizards.com

MEMORY

DESKTOP-LAPTOP-CAMERA-PRINTER

WE CAN BEAT ANY PRICE, ANYWHERE

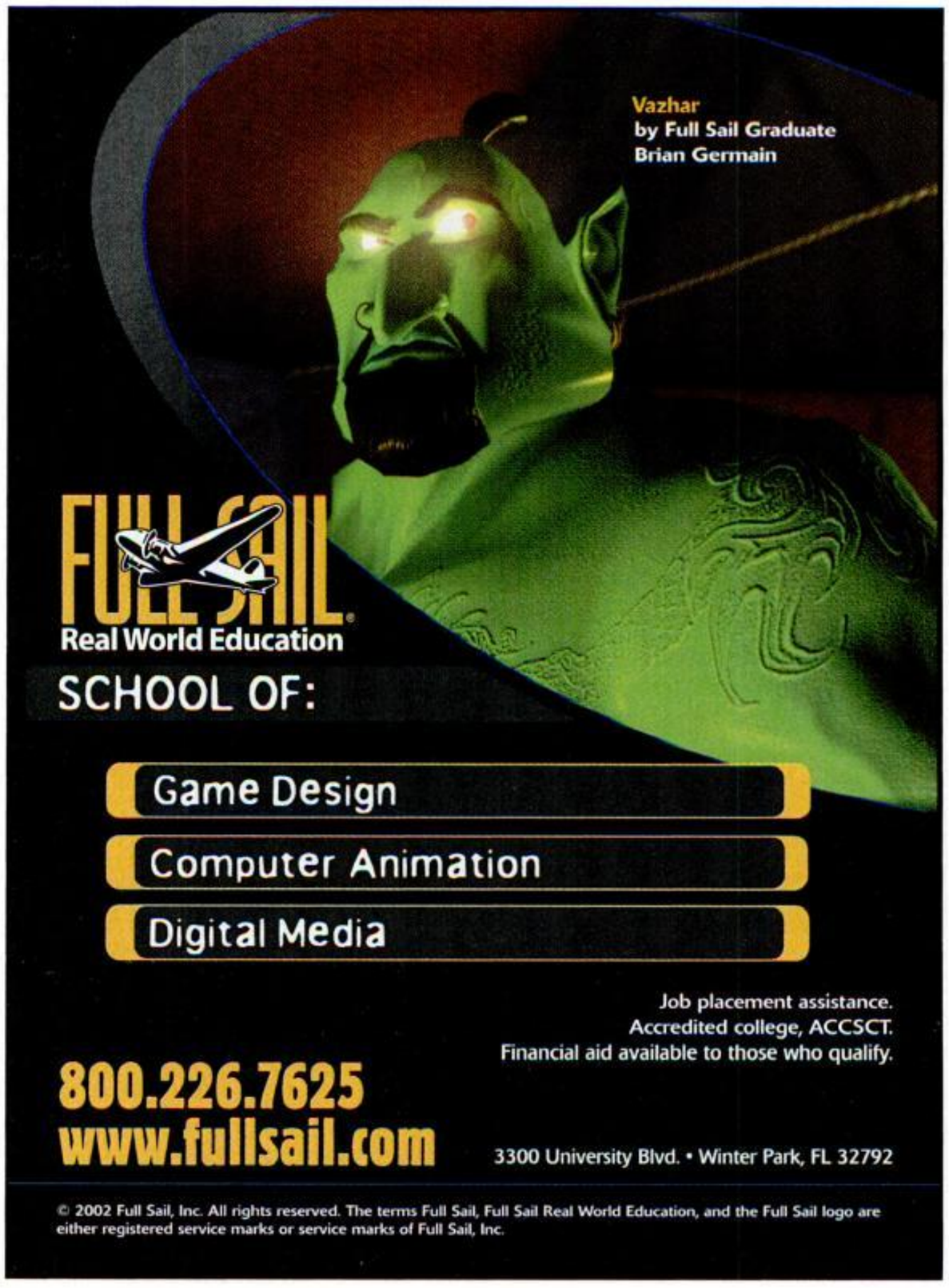
CALL AROUND...THEN CALL US!!!

"NOBODY CAN BEAT US...NOBODY"

LIFETIME WARRANTY-NEVER A RE-STOCKING FEE

1-800-4-MEMORY

WWW.18004MEMORY.COM


Vazhar
by Full Sail Graduate
Brian Germain
FULL SAIL
Real World Education
SCHOOL OF:
Game Design
Computer Animation
Digital Media
Job placement assistance.
Accredited college, ACCSCT.
Financial aid available to those who qualify.
800.226.7625
www.fullsail.com
3300 University Blvd. • Winter Park, FL 32792
© 2002 Full Sail, Inc. All rights reserved. The terms Full Sail, Full Sail Real World Education, and the Full Sail logo are either registered service marks or service marks of Full Sail, Inc.

CrazyPC

www.crazypc.com

Cooling, Case Mods, Game Gear
1-888-558-6005
sales@crazypc.com

CPU Coolers
High Performance

Aeroflow
$ 26.95

SLK-800
$ 36.95
Socket A

HDD Coolers

Aluminum w/Dual Fan
$14.95

Chip Coolers

GeForce4 Copper
$17.95

BGA RAM Sinks
$12.95

Fans

Tornado
80x38mm, 84CFM
$17.95

Crystal LED Fans
$10.95

Etched Windows

$29.95

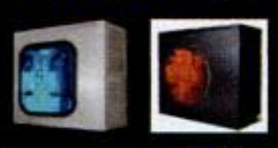
Bright PC LEDs

$16.95

Fan Covers

80mm
$10.95

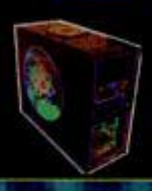
Window Kits



Round $13
Oval $13
Square $13

Cold Cathodes

Light Kits
$15.95



EL NEON Wire Kits
$23.95

Xbags

$43.95

Power Supplies

431 Watt
$87.95

Vantec
470 Watt
$124.95

Cables/Wires

IDE Round Cables
$8.95
and lower!

Mobile Racks

Vantec EZ Swap
LCD Alarm
$37.95

KF102 -
Alum. 2 Fans
$25.95

Cases

Biohazard Case - $190
Aluminum Mid-Tower, USB
Laser Cut Window, 4 Fans

Jupiter - $87.95
Aluminum Mid-Tower
Side Window, LCD, USB, Firewire

Lian-Li PC-61
Aluminum Mid-Tower,
USB 2.0, 4 fans
$129.95

Imperial
4x5.25",
3x3.5"ext,
3x3.5" int,
temp fan control
$48.95

Silver Fire Dragon - $190
Aluminum Mid-Tower, USB
Laser Cut Window, 4 Fans

Black Ice Mid-Tower
Neon incl, 10 Bays, USB, I/O Ports
$69.95

Copyrighted material

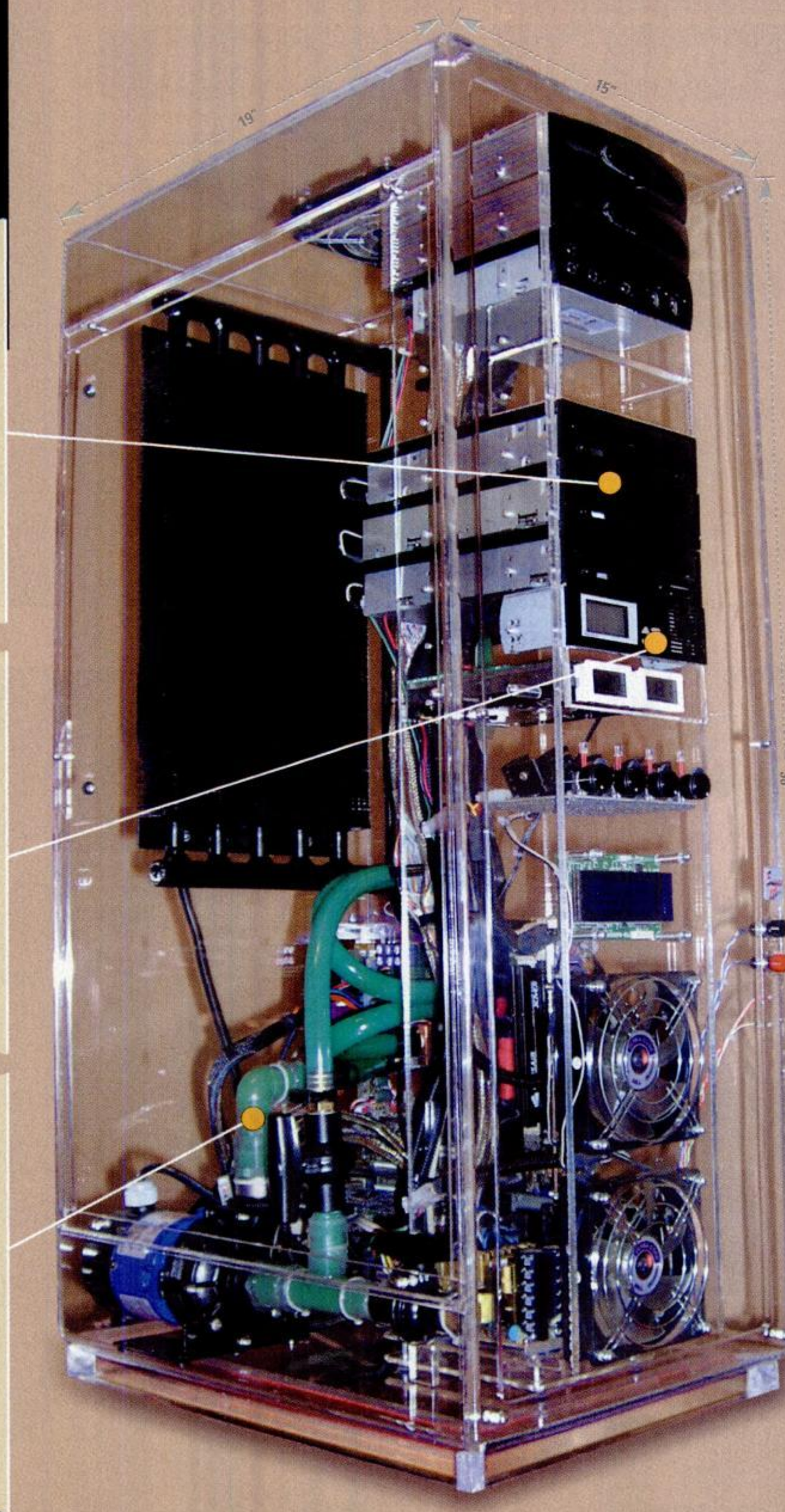
MAXIMUMPC Rig of the Month

If you have a contender for Rig of the Month, e-mail **input@maximumpc.com** with pics and a brief write-up.

THIS MONTH: ExtremeMHz Flagship PC

Talk about a team-building exercise! In an outstanding display of consensus and cooperation, the IT crew at Del Valle Food Products, Inc. in Miami, Florida, pooled its skills and smarts to create a PC mod of a most spectacular caliber—just for the heck of it (and for a common love of a good challenge). Thus was born the ExtremeMHz team and web site (which chronicles the group's projects).

Unfortunately, in the limited space we have here, we can point out only a fraction of the Flagship PC's considerable attributes.



"The biggest challenge we faced was finding a fabricator who was willing to take on a job of this magnitude," said VP Humberto Male, one of the team's leaders. In the end, Canadian company AcrylicPC came through with a case based on the team's decadent specs. It has five 120mm fan openings, 10 5.25-inch drive bays, a 20mm hole in the bottom panel for cable management, removable mobo tray, side panels, and drive cage, and an acrylic rod base outfitted with el-wire for lighting effect.

Optical duties are handled by a Kenwood 72x CD-ROM drive, a Plextor CD-RW drive, and a Pioneer DVD drive. Though not apparent in this picture, all the optical drives were modified with glass covers (in fitting with the overall aesthetic) and bedecked with LEDs that create a veritable light show when the drives are operating.

The whole kit and caboodle functions under the watchful eye of an elaborate monitoring system. Situated beneath the optical drives are a Digi-Doc for measuring internal temperatures, dual CompuNurse recorders for keeping tabs on the temps of the two AMD 2100+ MPs, a four-input fan controller, and a Matrix Orbital VFD (vacuum fluorescent display).

The unfortunate flip side to a case this dazzling is the cleaning regimen required to keep it looking as such. After just a month of use, the dust bunnies are plainly visible. Male told us that "in order to get a thorough cleaning, all the drive cage components have to be removed, cleaned, and reinstalled... no fun!"

The team went all out with the cooling. A copper tube radiator (painted black) resides on the back wall of the case and is encapsulated in an acrylic shroud to further its cooling capabilities. A modified water pump features clear PVC fittings and valves for filling, discharge, and flow regulation. Glass encapsulated thermistors are inserted into the inlet and outlet fittings to capture water temperatures.

To witness the Flagship PC in all its illuminated glory, and for other pertinent build details, visit **www.extrememhz.com/emflag1.html**. Our coverage hardly does it justice.

Copyrighted material

AREA-51™ DESKTOPGAMING

Intel® Pentium® 4 Processor with HT Technology 3.06GHz
533 FSB and 512KB Advanced Transfer Cache
High-Performance Heatsink/Cooling System
Intel® 850E Chipset Motherboard
512MB PC-1066 RDRAM
Black Floppy Drive 1.44MB
200GB 7200RPM Ultra ATA100 Hard Drive 8MB Cache
NVIDIA® GeForce™ FX 128MB DDR II
AlienAdrenaline: Video Performance Optimizer
Exclusive Koolmaxx™ Video Cooling System
Sound Blaster® Audigy 2™ 6.1 Sound Card
Black 16X/48X DVD-ROM Drive
Black 52X/24X/52X CD-RW Drive
Black Dragon Full-Tower ATX Case 420-Watt PS
Black Microsoft® Internet Keyboard
Black Microsoft® Intellimouse Explorer 3.0
10/100Mb Integrated Network Adapter
Microsoft® Windows® XP Home Edition
1-Year Toll-Free 24/7 Technical Support
with Aliencare On-Site Home Service
AlienAutopsy: Automated Technical Support
Personalized Owner's Manual
FREE Exclusive Alienware® T-Shirt
FREE Custom Alienware® Mouse Pad
Optimized & Configured for High-Performance

$2,699.00

MJ-12™ WORKSTATION

Dual Intel® Pentium® 4 Xeon Processors at 2.8GHz
512KB Advanced Transfer Cache
High-Performance Heatsink/Cooling System
Supermicro® Intel® E7505 Chipset Motherboard
1024MB ECC Registered PC-2100 DDR SDRAM
Black Floppy Drive 1.44MB
73.4GB Ultra320 SCSI Hard Drive
NVIDIA® Quadro™ FX 2000 128MB DDR II
Exclusive Koolmaxx™ Video Cooling System
Sound Blaster® Audigy 2™ 6.1 Sound Card
Black 16X/48X DVD-ROM Drive
Black 52X/24X/52X CD-RW Drive
Black Xeon EATX Case 420-Watt PS
Black Microsoft® Internet Keyboard
Black Microsoft® Intellimouse Explorer 3.0
10/100Mb Integrated Ethernet Controller
Microsoft® Windows® XP Professional
1-Year Toll-Free 24/7 Technical Support
with Aliencare On-Site Home Service
AlienAutopsy: Automated Technical Support
Personalized Owner's Manual
FREE Exclusive Alienware® T-Shirt
FREE Custom Alienware® Mouse Pad
Optimized & Configured for High-Performance

$5,499.00

The Alienware® Difference

- Built by Skilled Alienware® Technicians
- Stringent 200-point Quality Control Process
- Fully Upgradeable with No Proprietary On-board Components
- The Most Advanced and Personalized Online Customer Support Available
- **AlienAutopsy: Automated Technical Support Request System**

PLAYS BEST ON ALIENWARE

BE THE FIRST ON THE PLANET WITH

nVIDIA. GeForce™ FX

AVAILABLE NOW

NOW AVAILABLE
KLIPSCH PROMEDIA
GMX D-5.1
SPEAKERS
ONLY $299.00

Alienware® recommends Microsoft® Windows® XP.

Prices, configurations, and availability may change without notice. Monitor and speakers sold separately. Taxes and shipping charges not shown. Alienware can not be held responsible for errors in photography or typography. On-site service may be provided via contracted third party, service not available in all areas. Technician will be dispatched if deemed necessary following telephone-based troubleshooting. For complete information on warranty, support, and on-site service, visit www.alienware.com. For hard drives, GB means 1 billion bytes and accessible capacity may vary depending on configuration. For CD-ROM, DVD-ROM, CD-RW, and DVD+RW/+R drive(s), maximum data transfer rates may vary and discs created with these drives may not be compatible with all drives and players. For modems and network cards/hardware, maximum achievable data transfer rates may vary. Award(s) and quote(s) listed do not pertain to a specific system or configuration. Intel, Intel Inside Logo, and Pentium are registered trademarks of Intel Corporation. All registered trademarks and trademarks are the property of their respective owners. Actual case may vary in design.

Copyrighted material

PLAYS BEST ON ALIENWARE®

BE THE FIRST ON THE PLANET WITH

AVAILABLE NOW

► Custom Build Your Dream Machine at:

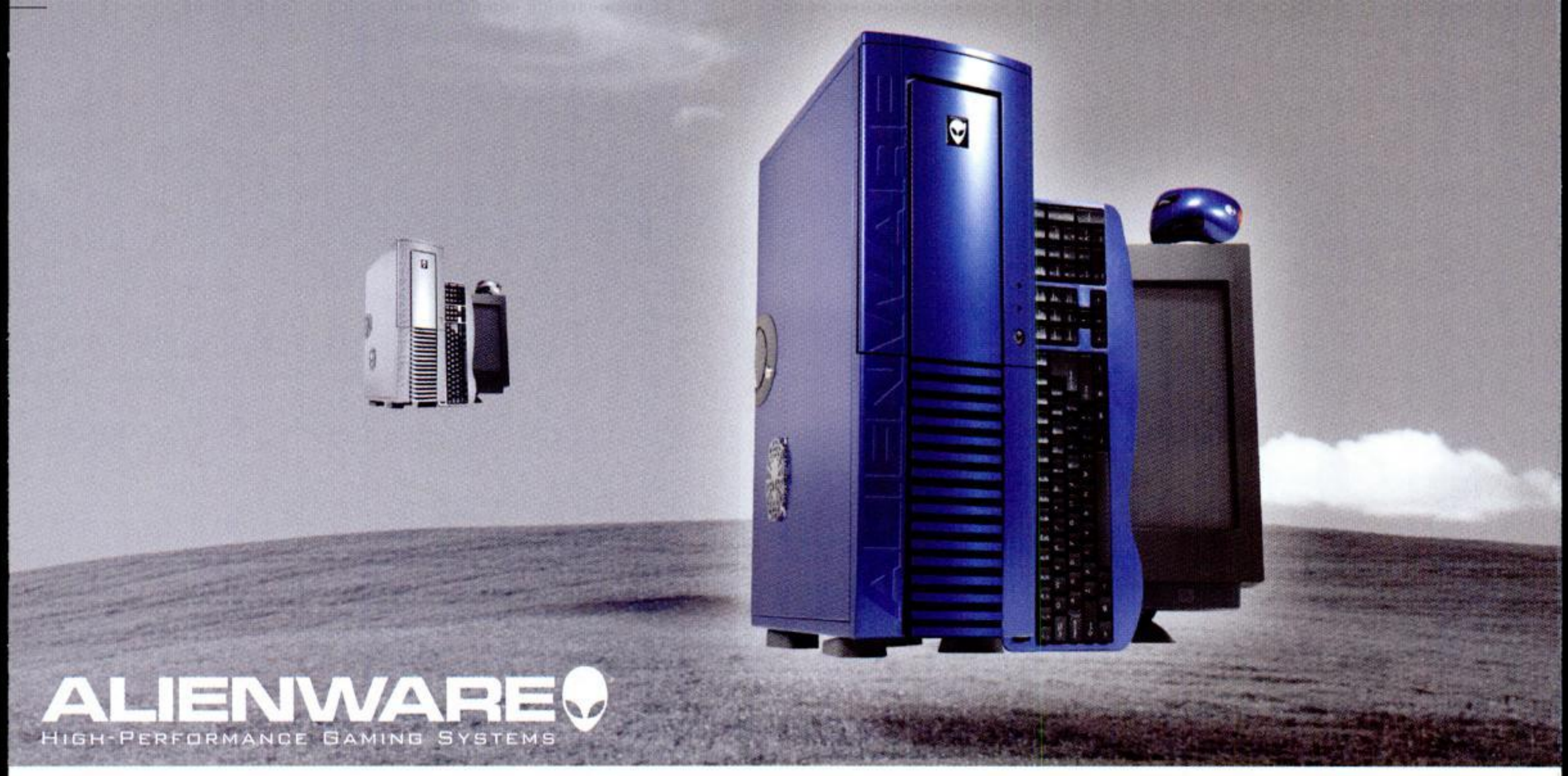
WWW.ALIENWARE.COM

► For More Information Call Toll-Free:

1-800-ALIENWARE

(1-800-254-3692)

Copyrighted material



Under the Hood

At Alienware® the selection of components is just as important as building the actual system. No proprietary components are used and every single item put inside the case is guaranteed to be the highest quality component available at that time. Simply put, Alienware® systems are the best systems available.

"The Area-51 is simply the fastest PC we've ever tested."
- Maximum PC

Incredible Attention to Detail

Every Alienware® system undergoes a 200-point quality control process. During this process, every wire is neatly secured and routed as to not interfere with proper air flow within the chassis. Every system that leaves the factory is regarded as a work of art, hand built by technicians who take enormous pride in their work.

"Alienware's new Area-51 is the absolute fastest PC ever to grace our workbench."
- PC Gamer

"Computer Gaming World's Ultimate Gaming Champion!"
- Computer Gaming World

Is Beauty Only Skin Deep?

What good is a beautiful interior without a complementary exterior? Alienware® systems are available in a variety of intense custom colors. This includes cases, mice, and keyboards. The stunning metallic finish of your new Alienware® system is enough to turn anyone green with envy!

"There can only be one. The winner is clearly Alienware!"
- Computer Games

Is There Life Beyond Gaming?

So how does a system built for gaming perform in other tasks? The most demanding tasks a computer system can perform are those which involve complex graphic and video calculations. As a result, a system built for gaming performs above and beyond any standard system's expectations.

"...justifies its name with out-of-this-world speed."
- CNet

"Unbeatable for all types of applications, even video encoding."
- Computer Shopper

Custom Build Your Dream Machine at **WWW.ALIENWARE.COM**

Copyrighted material

AREA-51™ DESKTOPGAMING

Intel® Pentium® 4 Processor with HT Technology 3.06GHz
533 FSB and 512KB Advanced Transfer Cache
High-Performance Heatsink/Cooling System
Intel® 850E Chipset Motherboard
512MB PC-1066 RDRAM
Black Floppy Drive 1.44MB
200GB 7200RPM Ultra ATA100 Hard Drive 8MB Cache
NVIDIA® GeForce™ FX 128MB DDR II
AlienAdrenaline: Video Performance Optimizer
Exclusive Koolmaxx™ Video Cooling System
Sound Blaster® Audigy 2™ 6.1 Sound Card
Black 16X/48X DVD-ROM Drive
Black 52X/24X/52X CD-RW Drive
Black Dragon Full-Tower ATX Case 420-Watt PS
Black Microsoft® Internet Keyboard
Black Microsoft® Intellimouse Explorer 3.0
10/100Mb Integrated Network Adapter
Microsoft® Windows® XP Home Edition
1-Year Toll-Free 24/7 Technical Support
with Aliencare On-Site Home Service
AlienAutopsy: Automated Technical Support
Personalized Owner's Manual
FREE Exclusive Alienware® T-Shirt
FREE Custom Alienware® Mouse Pad
Optimized & Configured for High-Performance

$2,699.00

MJ-12™ WORKSTATION

Dual Intel® Pentium® 4 Xeon Processors at 2.8GHz
512KB Advanced Transfer Cache
High-Performance Heatsink/Cooling System
Supermicro® Intel® E7505 Chipset Motherboard
1024MB ECC Registered PC-2100 DDR SDRAM
Black Floppy Drive 1.44MB
73.4GB Ultra320 SCSI Hard Drive
NVIDIA® Quadro™ FX 2000 128MB DDR II
Exclusive Koolmaxx™ Video Cooling System
Sound Blaster® Audigy 2™ 6.1 Sound Card
Black 16X/48X DVD-ROM Drive
Black 52X/24X/52X CD-RW Drive
Black Xeon EATX Case 420-Watt PS
Black Microsoft® Internet Keyboard
Black Microsoft® Intellimouse Explorer 3.0
10/100Mb Integrated Ethernet Controller
Microsoft® Windows® XP Professional
1-Year Toll-Free 24/7 Technical Support
with Aliencare On-Site Home Service
AlienAutopsy: Automated Technical Support
Personalized Owner's Manual
FREE Exclusive Alienware® T-Shirt
FREE Custom Alienware® Mouse Pad
Optimized & Configured for High-Performance

$5,499.00

The Alienware® Difference

- Built by Skilled Alienware® Technicians
- Stringent 200-point Quality Control Process
- Fully Upgradeable with No Proprietary On-board Components
- The Most Advanced and Personalized Online Customer Support Available
- **AlienAutopsy: Automated Technical Support Request System**

PLAYS BEST ON ALIENWARE

BE THE FIRST ON THE PLANET WITH

nVIDIA. GeForce™ FX

NOW AVAILABLE
KLIPSCH PROMEDIA
GMX D-5.1
SPEAKERS
ONLY $299.00

AVAILABLE NOW

Alienware® recommends Microsoft® Windows® XP.

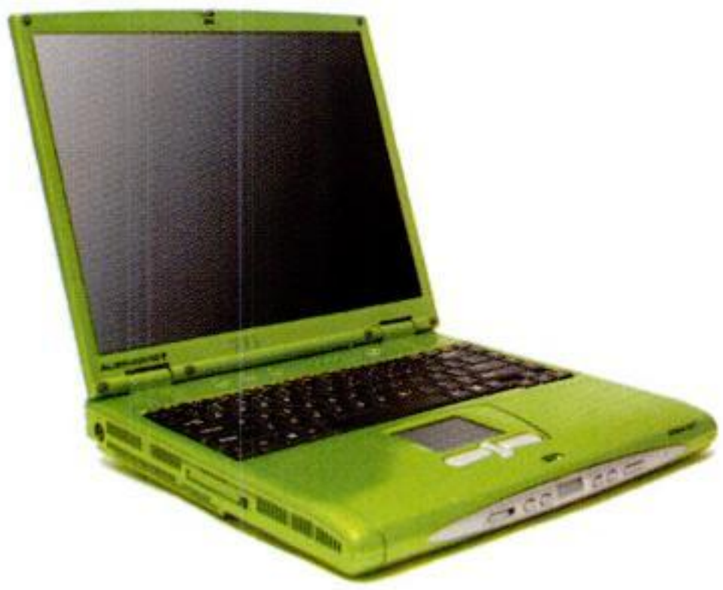
Prices, configurations, and availability may change without notice. Monitor and speakers sold separately. Taxes and shipping charges not shown. Alienware can not be held responsible for errors in photography or typography. On-site service may be provided via contracted third party, service not available in all areas. Technician will be dispatched if deemed necessary following telephone-based troubleshooting. For complete information on warranty, support, and on-site service, visit www.alienware.com. For hard drives, GB means 1 billion bytes and accessible capacity may vary depending on configuration. For CD-ROM, DVD-ROM, CD-RW, and DVD+RW/+R drive(s), maximum data transfer rates may vary and discs created with these drives may not be compatible with all drives and players. For modems and network cards/hardware, maximum achievable data transfer rates may vary. Award(s) and quote(s) listed do not pertain to a specific system or configuration. Intel, Intel Inside Logo, and Pentium are registered trademarks of Intel Corporation. All registered trademarks and trademarks are the property of their respective owners. Actual case may vary in design.

Copyrighted material

"The mobile Alienware is the fastest notebook we've ever tested."

- Maximum PC

MAXIMUM PC KICK ASS PRODUCT



Area-51m™: Mobile Gaming

The Area-51m™ represents the first fully capable mobile gaming solution. The performance requirements of today's most cutting edge games have been simply too demanding for a mobile system, until now. The Area-51m™ plays games at blistering speeds, handles quick motion with incredible accuracy, and performs phenomenally high in benchmarks. Perfect for LAN parties and for those who simply can not part from their desktop system's performance, the Area-51m™ is the ultimate mobile gaming machine™.

AREA-51m™ MOBILEGAMING

- Intel® Pentium® 4 Processor at 3.06GHz
- 533 FSB and 512KB Advanced Transfer Cache
- High-Performance Heatsink/Cooling with Arctic Silver III
- Intel® 845MP+ ICH3M Chipset Motherboard
- 512MB PC-2100 DDR SDRAM
- Exclusive Metallic Cyborg Green Chassis
- 40GB 5400RPM Ultra ATA100 Hard Drive
- 15.0" UltraXGA+ Enhanced TFT Active Matrix LCD
- ATI® Mobility RADEON™ 9000 PRO 128MB DDR
- with Dual-View Display Monitor and TV-out
- AlienAdrenaline: Video Performance Optimizer
- Removable 3.5" Floppy Drive 1.44MB
- Removable 24X/10X/24X CD-RW/8X DVD Combo Drive
- Sound Blaster® PRO Compatible with Wavetable
- 5.1 3D Surround Sound with S/PDIF Digital Output
- Front Panel Audio DJ CD Player
- Allows CD Play While System is On or Off
- One Type II PCMCIA Slot
- Four USB 2.0 Ports and One IEEE 1394 Port
- Infrared Wireless Fast IR Interface
- 10/100Mb Ethernet LAN and 56K Modem
- Dimensions: (H) x (W) x (D) : 1.7" x 13" x 11.4"
- Weight: 7.6lbs. without battery
- Exclusive 120-Watt A/C Adapter
- Microsoft® Windows® XP Home Edition
- 1-Year Toll-Free 24/7 Technical Support
- AlienAutopsy: Automated Technical Support
- Personalized Owner's Manual
- FREE Exclusive Alienware® T-Shirt
- FREE Custom Alienware® Mouse Pad
- Optimized & Configured for High-Performance

$2,999.00

Desktop and Mobile Systems available in custom metallic colors!

Alienware® recommends Microsoft® Windows® XP Professional for Mobile Computing.

Copyrighted material

PLAYS BEST ON

ALIENWARE®

BE THE FIRST ON THE PLANET WITH

AVAILABLE NOW

► Custom Build Your Dream Machine at:

WWW.ALIENWARE.COM

► For More Information Call Toll-Free:

1-800-ALIENWARE

(1-800-254-3692)

Copyrighted material